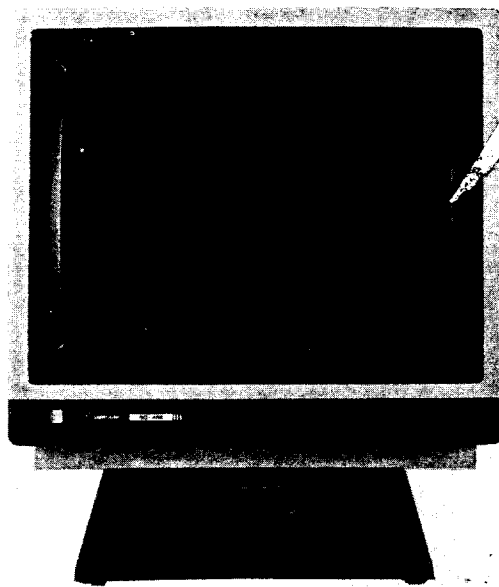


# SERVICE MANUAL

SC-452



## SPECIFICATION

|                   |                                        |
|-------------------|----------------------------------------|
| Picture tube..... | 37JGG68X, B22                          |
|                   | 14 Inches diagonal                     |
|                   | 90 degree deflection, 0.52mm dot pitch |
|                   | Strife type, black matrix              |
| Input signal..... | Video.....RGBI TTL level positive      |
|                   | Sync.....TTL level positive            |
| Display           |                                        |
| -Colors.....      | 16 colors                              |
| Synchro           |                                        |
| -Nization.....    | Horizontal.....15.2~16.3KHz            |
|                   | Vertical.....47~63Hz                   |
| Resolution.....   | Horizontal.....480 dots                |
|                   | Vertical.....200 lines                 |
| Video band        |                                        |
| -Width.....       | 15MHz (-3 dB)                          |
| Display area..... | Horizontal.....252 ±4mm                |
|                   | Vertical.....147 ±4mm                  |
| AC input          |                                        |
| -Voltage.....     | AC 120V/60Hz, AC 230V/50Hz (Optional)  |
| Power             |                                        |
| -Consumption..... | 70W max                                |
| Dimension.....    | 350(W)×393(H)×382(D) mm                |
| Weight.....       | 13.8kg max                             |

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## SECTION I GENERAL INFORMATION

### (I) SAFETY PRECAUTION

**WARNING:** Service should not be attempted anyone unfamiliar with the necessary precautions on this unit.  
The following precautions are necessary during servicing.

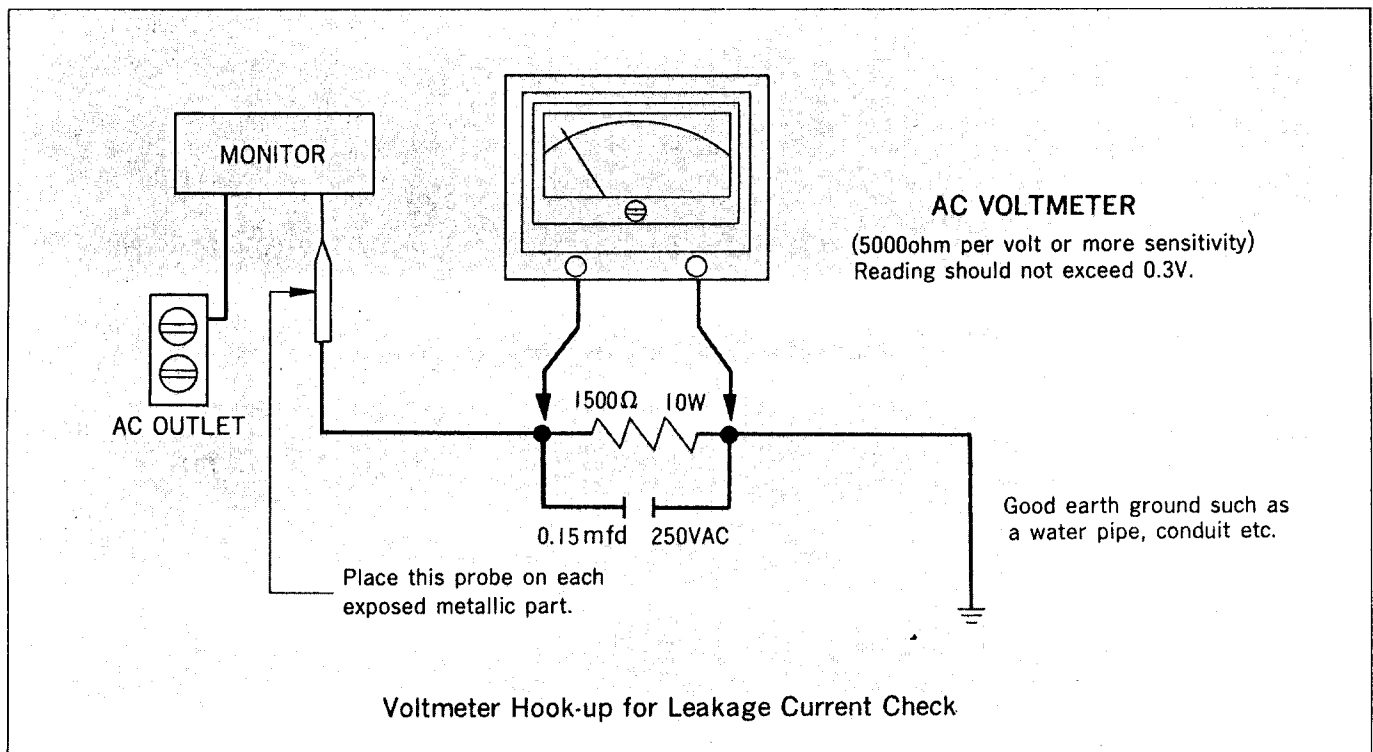
1. Some parts such as a picture tube in this unit have special safety-related characteristics for X-RAY RADIATION protection.  
For continued safety, the parts replacement should be undertaken referring to item 2 below.
2. Many electrical mechanical parts in this unit have special safety-related characteristics for protection against shock hazard and others.  
These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage wattage, etc.  
Replacement parts which have these special characteristics are identified in the manual and supplements by shading on the schematic diagram and the parts list.  
Before replacing of these components read the parts list in this manual, carefully.
3. When replacing chassis in the cabinet, always be certain that all the protective devices are installed properly, such as insulating covers, strain relief, etc.
4. Before replacing the back cover of the set, thoroughly inspect inside the cabinet to see that no stray parts or

tools have been left inside.

5. Before returning the set to the customer always perform an AC leakage current check on the exposed metallic parts of the cabinet, such as terminal, screwheads, metal overlays, control shafts, etc. To be sure the set is safe to operate without danger of electrical shock. Plug the AC line cord directly into a 120V AC outlet (do not use a line isolation transformer during this check). Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner.

Connect a 1500 ohm, 10 watt resistor, paralleled by a 0.15mfd( $\mu$ F), 250V AC capacitor, between a known good earth ground (water pipe, conduit, etc.) and the exposed metallic parts, one at a time.

Measure the AC voltage across the combination of 1500 ohm resistor and 0.15 mfd( $\mu$ F) capacitor. Reverse the AC plug at the AC outlet and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.3V RMS. This corresponds to 0.2mA AC any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



## [2] DOCUMENT DESCRIPTION

This is technical specification for a SC-452 Color display monitor.

This document contains information on all technical details of the monitor.

## [3] PRODUCTION DESCRIPTION

This SC-452 Color display monitor to be operated in

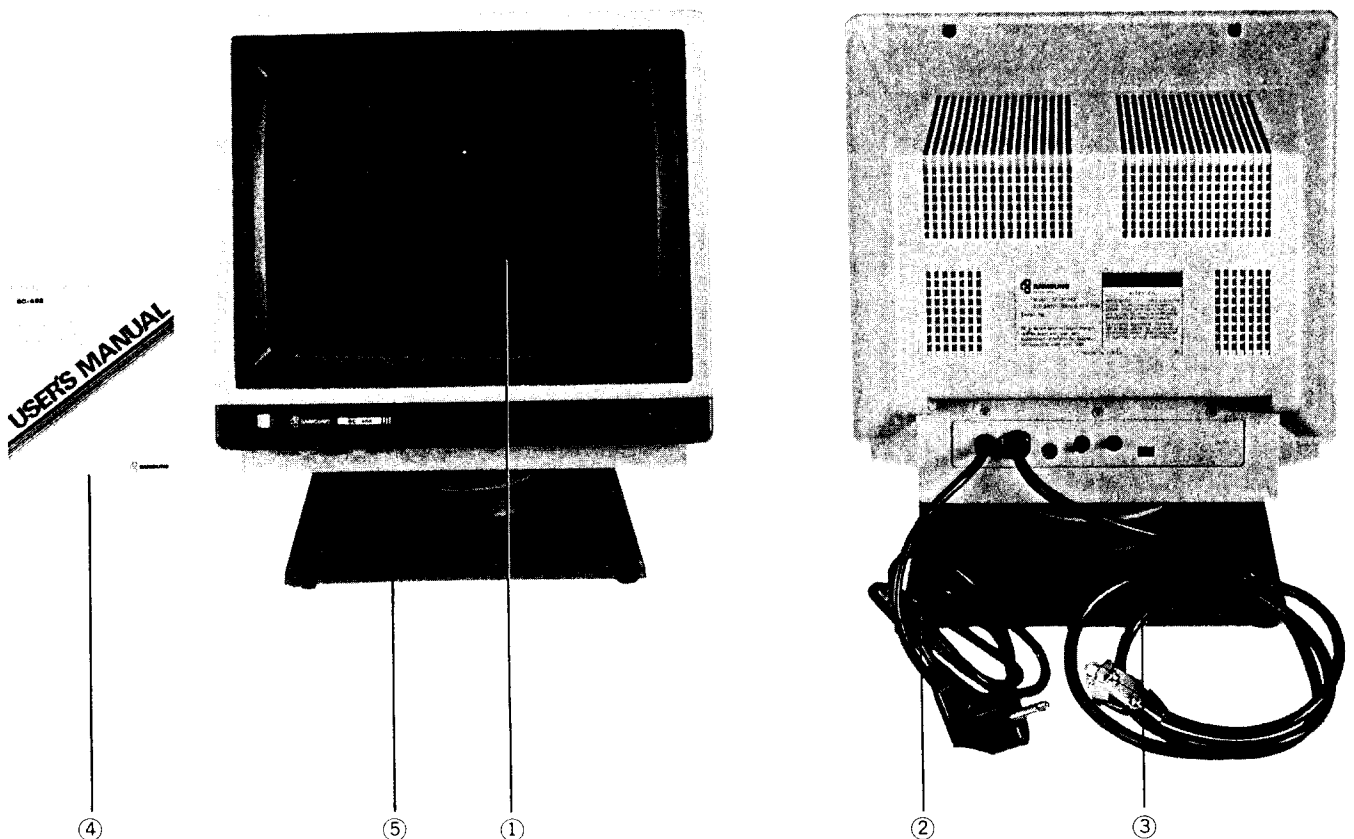
TTL Drive mode in put a highlight of these is provided below.

- Resolution : 480 dots (H) × 200 line (V)
- Display capability : 2000 Characters (80 × 25)
- Active display area : Horizontal ~ 252mm ± 4mm Vertical 174mm ± 4mm
- Horizontal frequency : 15.75KHz
- Vertical frequency : 60Hz/50Hz

## USING SC-452 COLOR DISPLAY MONITOR

Meeting SC-452, Color display monitor.

Refer to the diagram below to be sure that your SC-452, package includes all the items in this picture. Save the original box and packing materials in case you have to ship or transport SC-452.



- ① Color display monitor (SC-452)
- ② Power cord
- ③ Signal cable: Connects IBM PC or Compatibles
- ④ User's manual
- ⑤ Swivel/Tilt stand: Enables you to position SC-452 at the best angle and tilt for easy viewing.

#### [4] OPERATING INSTRUCTION

1. External instruction
  - \* Front  
Power switch contrast, brightness, green switch (option)
  - \* Rear  
Horizontal hold, vertical hold, vertical size
2. Service instruction (internal controls)  
Supply voltage, sub brightness, Horizontal center, vertical center, brown color controls.

#### [5] ELECTRICAL CHARACTERISTICS

1. AC Power input  
AC  $115V \pm 15\%$ , 60Hz  
AC 220~240V, 50Hz (Optional)  
Power consumption is 70W under normal viewing condition and be used internal fuse protection.
2. Video input
  - Video : RGB1 TTL Level, Positive
  - Sync : TTL Level, Positive
  - Band width : 15MHz (-3dB)
3. Horizontal electronics
  - Frequency : 15.2KHz~16.3KHz
  - Retrace time : 11.16uS
4. Vertical electronics
  - Frequency : 47Hz~63Hz
  - Retrace time : 9.55uS

#### [6] MECHANICAL SPECIFICATION

Figure-Shows the mechanical specification for the CPT display monitor.

#### [7] DISPLAY CHARACTERISTICS

1. Display size : H;  $252 \pm 4$ mm  
V;  $147 \pm 4$ mm

2. Display capability :  $5 \times 7$  dot matrix character pattern 2000 characters,  $80 \times 24$  lines.

#### [8] CPT CHARACTERISTICS

1. Type : 14" in-line GUN (37JGG68X)  
90 degree deflection angle
  2. Phosphor : P22 C.I.E Coordinates
  3. Neck diameter :  $29.1 \phi$
  4. Phosphor dot pitch : 0.52mm Maximum
  5. Implosion protection to be approved by U.L and C.S.A
  6. Degaussing : Automatic degaussing shall be provided
- \* Deflection yoke and neck components are preset in CPT factory, So there is no need for purity adjustment.

#### [9] ENVIRONMENTAL SPECIFICATION

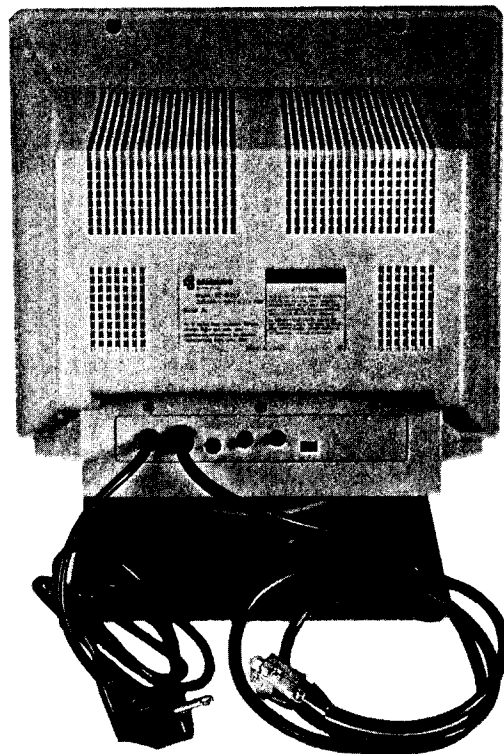
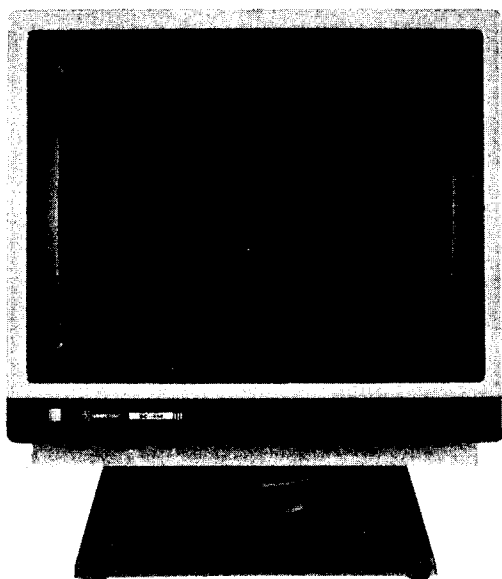
1. Operating temperature :  $5^{\circ}\text{C}$  to  $40^{\circ}\text{C}$  Centigrade in side enclosure
2. Relative humidity : 20% to 80% Enclosure convection cooled (non condensing)
3. Temperature storage :  $-20^{\circ}\text{C}$  to  $60^{\circ}\text{C}$  out side enclosure

#### [10] WEIGHT

Weight : 13.5kg

## SECTION II SERVICE INFORMATION

\* Control and terminal identification



[Important notice for service personel before servicing]

### PLEASE READ BEFORE ATTEMPTING SERVICE

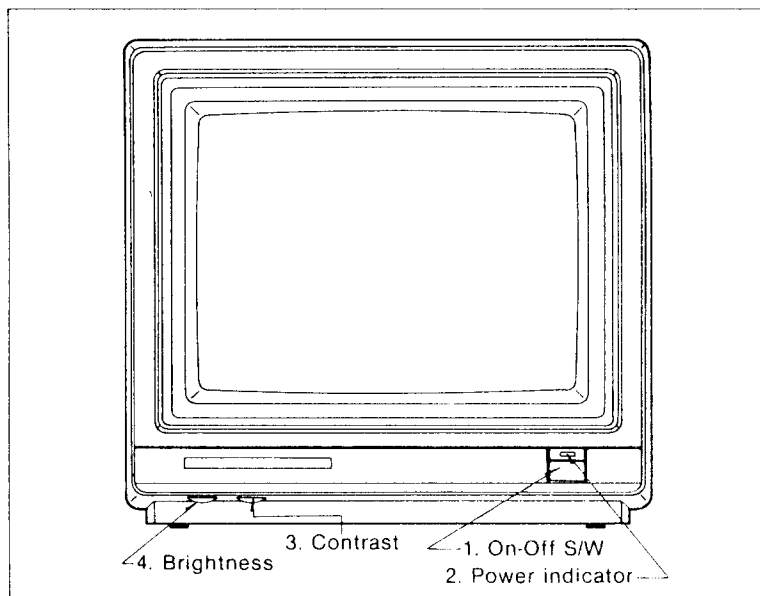
- ① Line voltage must be kept with in  $\pm 15\%$  of the rated voltage.
- ② Do not discharge ARC or measure high voltage when high voltage lead is connected to CPT.  
Discharge 2ND anode of CPT only after high voltage lead has been disconnected.  
Do not discharge high voltage lead at any time, damage to transistors may result.
- ③ While the monitor is in operation, do not attempt to connect or disconnect any wires.
- ④ Disconnect all power before attmepting any repairs.
- ⑤ When the power is on do not attempt to short any portion of the circuit.  
This shorting may cause damage to the transistor in receiver.

## (I) ADJUSTMENT

Apply power and TTL video signal to the data display

### I. ADJUSTING THE FRONT CONTROLS

FRONT VIEW



#### ① Power switch

Used to push the power on or off.

When the power is on the power indicator (LED) is lit.

#### ② Bright control

1) The brightness control knob shall provide the customer with means for adjusting the display intensity off set level as viewing conditions vary.

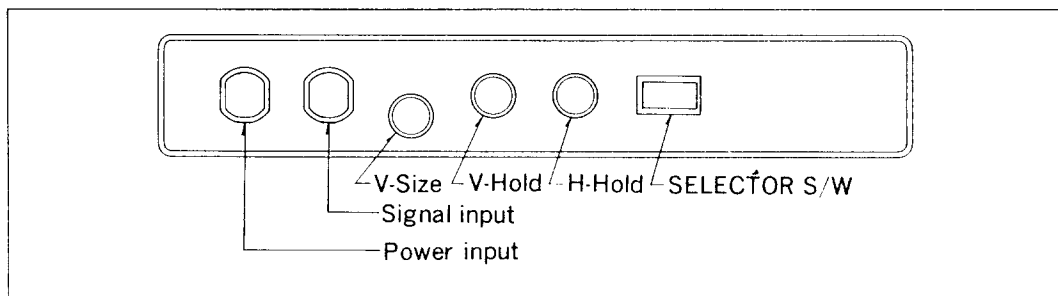
2) The maximum brightness (fully clock wise) level shall be limited with the internal sub brightness factory adjustment.

3) Control shall adjust the ground raster to the point of extinction.

#### ③ Contrast control

Adjusts the display to the contrast preferred by the user.

### 2. ADJUSTING THE REAR CONTROLS



- ① H-Hold control  
Adjusts the horizontal stability of the display.
- ② V-Hold control  
Adjusts the vertical stability of the display.
- ③ V-Size control  
Turn this knob for the proper vertical size of the display. Turn the knob clock wise for a larger display, turn it counter clock wise for a smaller display.
- ④ Selector switch (H-center switch)  
If you are using the monitor with the APPLE compatible, the S/W 501, should be to the right side.  
If you are using the monitor with the IBM compatible, the S/W 501, should be to the left side.

### 3. ADJUSTING THE INTERNAL CONTROLS

#### HORIZONTAL ADJUSTMENT

- ① Received the cross hatch pattern.
- ② Turn VR 502 and adjust it until synchronization is secured.
- ③ Signal and turn the power switch ON/OFF and this confirm the stability of sync.
- ④ If picture positions is left or right at center of CPT face, adjust the H-shift of VR501 properly.

#### VERTICAL ADJUSTMENT

- ① Received the cross hatch pattern.
- ② Turn VR401, and adjust it until sync secured.
- ③ The pattern position is up or down at the center of CPT face by adjust the V-shift of VR452 properly.

#### FOCUS ADJUSTMENT

- ① Received the bull's eye (@) pattern.
- ② Adjust the brightness V/R control for generally bright.
- ③ Adjust the focus V/R control for best condition.

#### COLOR PURITY ADJUSTMENT

- ① Operate the receiver for 15Min. With brightness control at maximum to warm up the CPT.
- ② Degauss the receiver fully by using an external degaussing coil.
- ③ Roughly adjust convergency.
- ④ Receive a black and white signal.
- ⑤ Turn red and blue low light controls fully counter clock wise, if green field.  
Adjust drive controls, if green field is not obtained.
- ⑥ Loosen the deflection yoke clamp screw, and move the DY to the purity magnet as close as possible.
- ⑦ Loosen purity magnet clamping and adjust the purity magnet to set the vertical green raster precisely as the center of screen, then tighten the clamping.
- ⑧ Slowly move the deflection yoke forward and adjust for the best overall green screen.
- ⑨ Tighten the deflection yoke clamp screw.

- ⑩ Produce the blue and raster by low.  
Light controls and observe that good purity is obtained on the respective field.
- ⑪ Observe that uniform white raster is obtained by adjusting R.G.B low light controls.  
If screen is not uniformly white, repeat above procedure.

#### WHITE BALANCE ADJUSTMENT

- ① Turn in a black and white program.
- ② Turn the brightness controller fully counter clock wise and adjust VR351.352.353.354.355 in the mechanical center.
- ③ Slowly turn the screen control clock wise from the full counter clock wise position, until two colors out of three R.G.B appear horizontal on the picture tube.
- ④ Extinguish the two horizontal all colors on the picture tube by turning the two respective low light controls fully, counter clock wise.
- ⑤ Turn the screen control further clock wise until the three color appears as a faint horizontal line on the picture tube.
- ⑥ Make the horizontal line white by turning the two low light controls white were previously set fully counter clock wise as step 3.
- ⑦ Alternately adjust the red blue drive controls to produce a normal black and white picture, check the black and white picture detail proper black and white condition (no coloration) from low lights to highlights at all brightness level for proper tracking.

Proper tracking at all brightness levels can be obtained when the controls, low light controls, and drive controls are properly adjust, if the results are unset is factory, repeat all the above steps.

#### CONVERGENCE ADJUSTMENT

\* Note; Before adjusting convergence, vertical size, linearity and focus adjustment must be completed.

- ① Received the cross pattern.
- ② The brightness level should be on higher than necessary to obtain a clear pattern.
- ③ Loosen the convergence magnet clamp and converge the red and blue at the center of the screen, by rotating the R-B static convergence magnet.
- ④ Align the converged red/blue dots with the green static convergence magnet.
- ⑤ Tighten the convergence magnet clamp.
- ⑥ Remove the DY wedges, and slightly tilt the DY for horizontal and vertical to obtain good overall convergence.
- ⑦ Secure the deflection by inserting the wedge.
- ⑧ If purity error is found, repeat the purity adjustment.

## [2] TROUBLE SHOOTING

### I. TROUBLE SHOOTING INFORMATION CHART

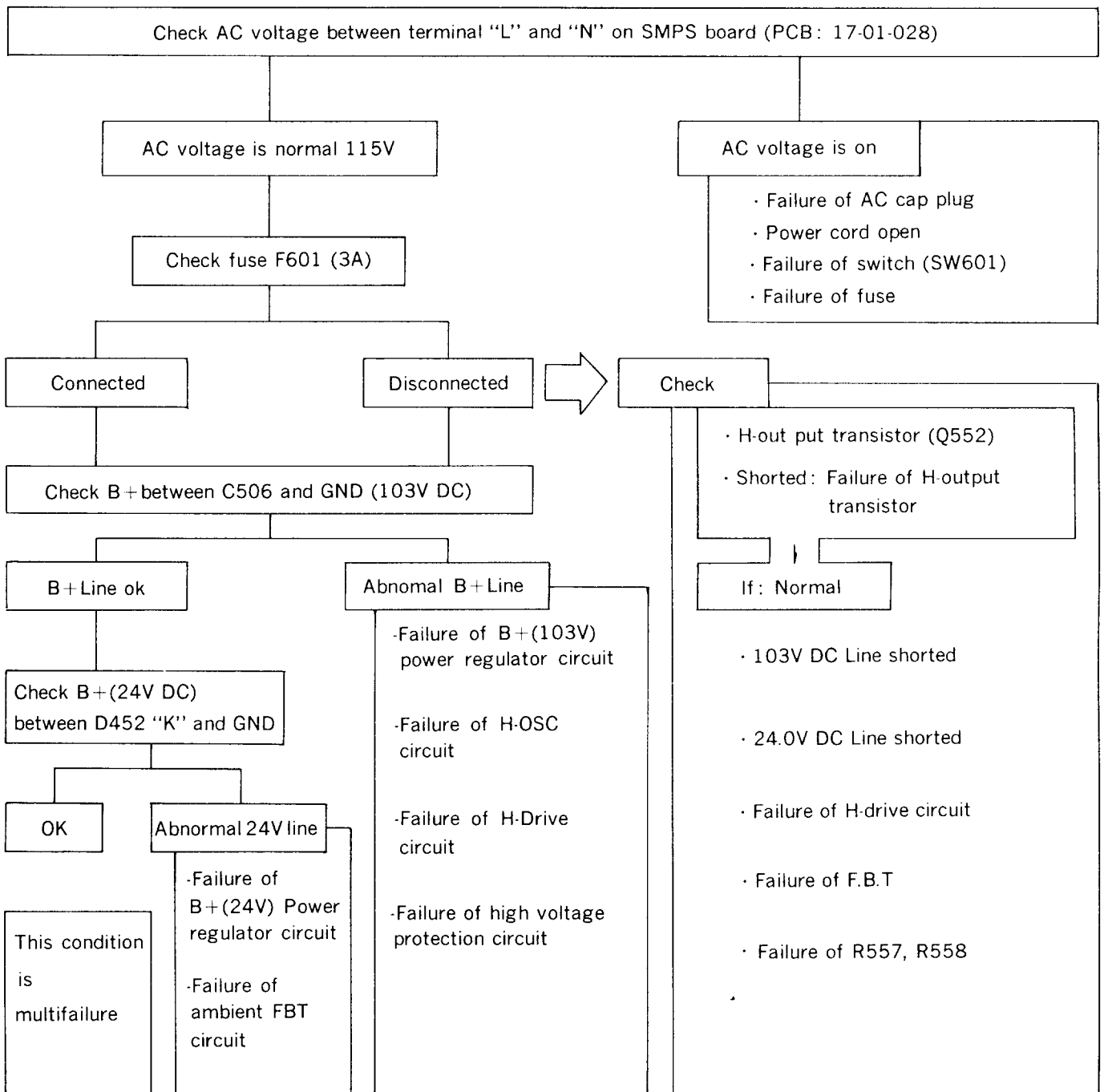
#### \* INTRODUCTION

This is the trouble shooting section. It consists of a symptom chart, showing the symptom and an action to be taken to rectify the problem.

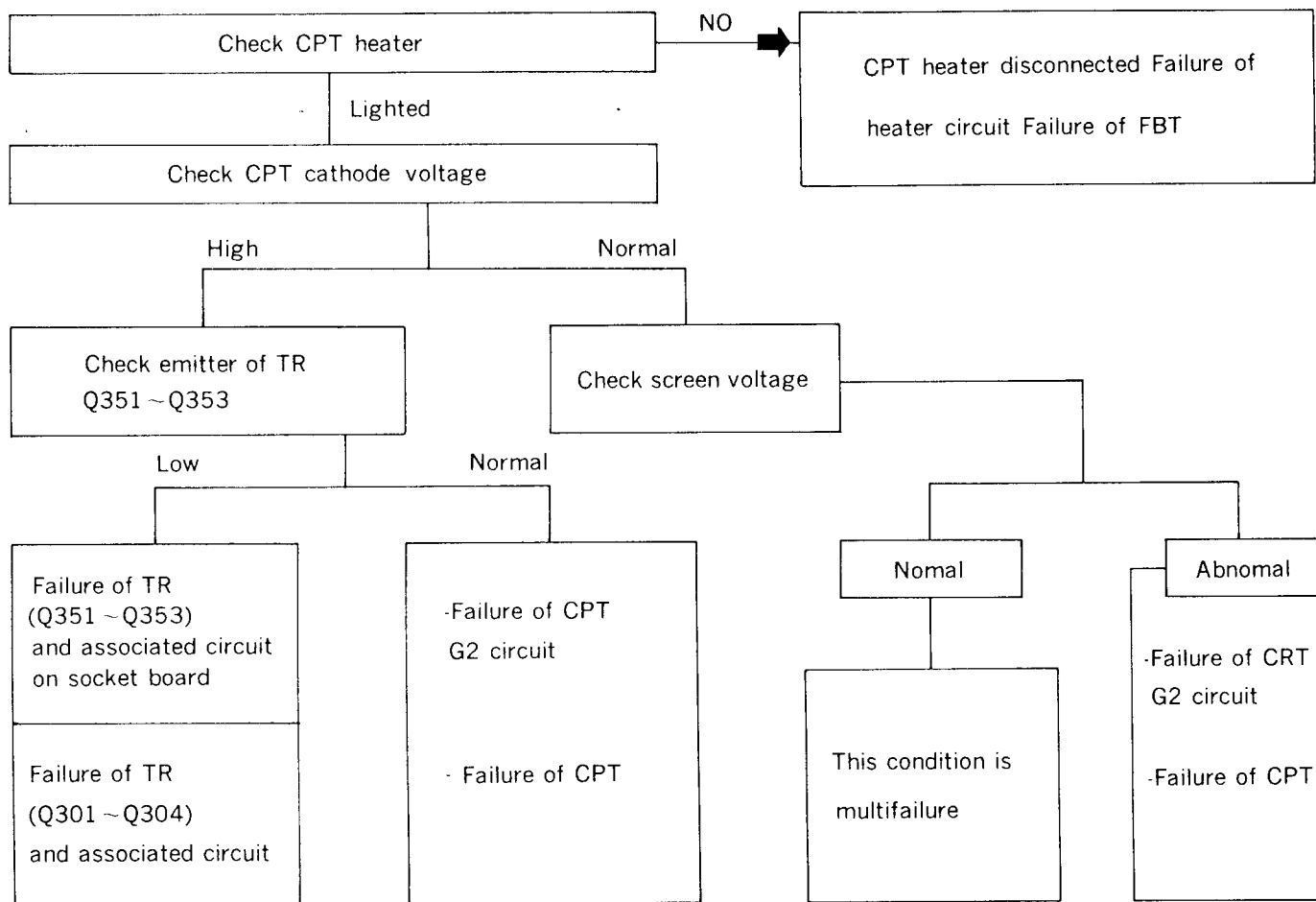
The best way to use this section is;

- ① Look on the chart to find the symptom that matches what the defective monitor is doing
- ② Try the recommended action.

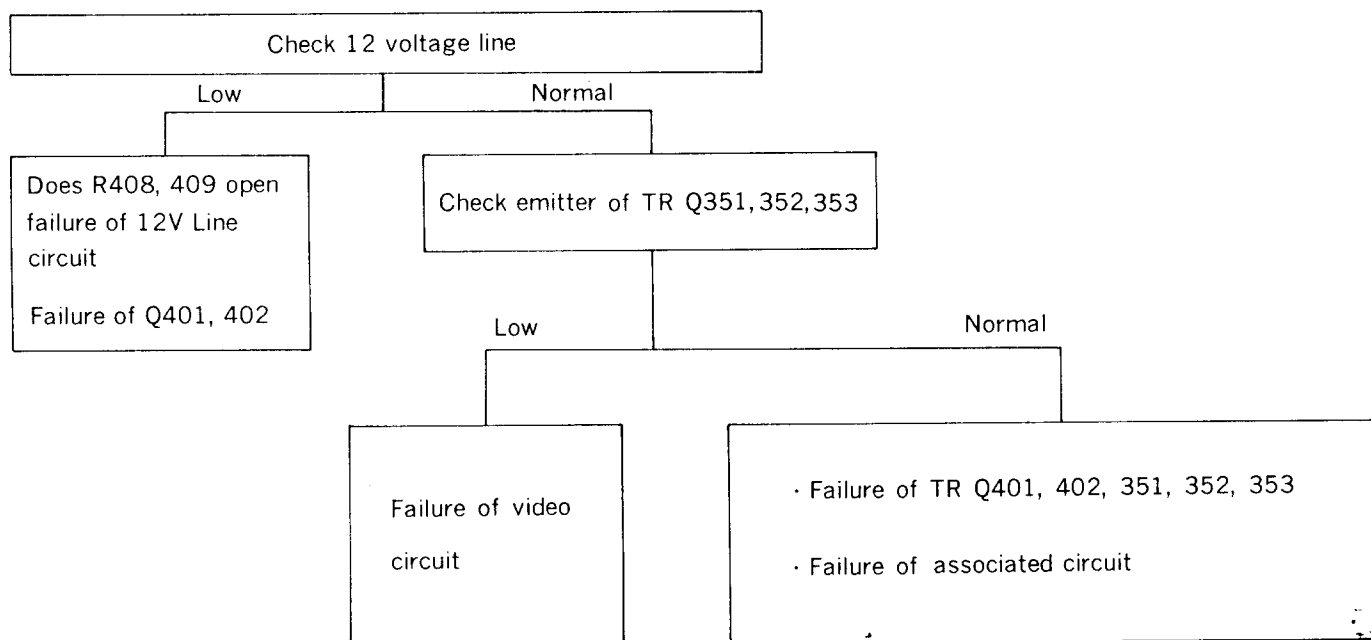
#### ① NO RASTER



(2) B I (115V) NORMAL, NO RASTER

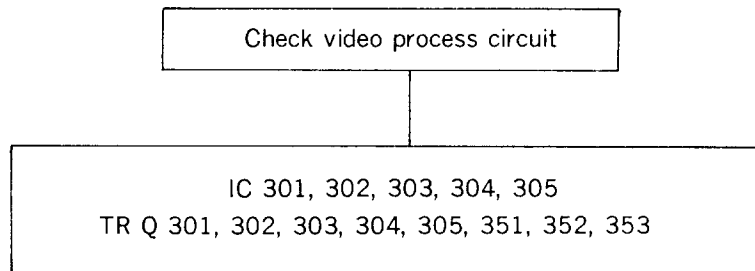


③ ABNORMAL BRIGHTNESS OF SCREEN

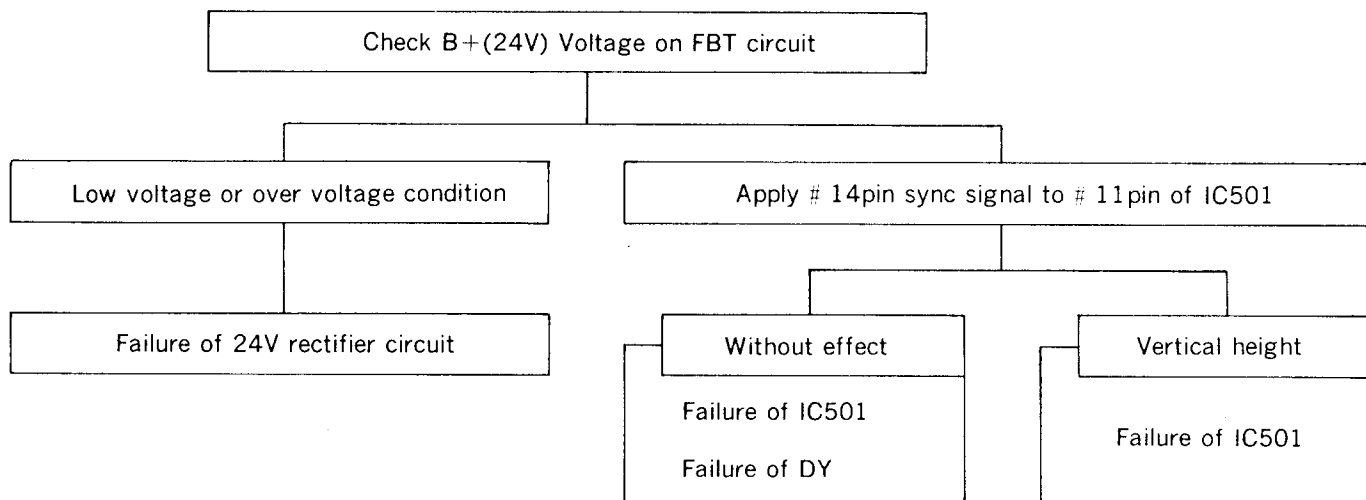


④ NOMAL RASTER, PICTURE ABNOMAL

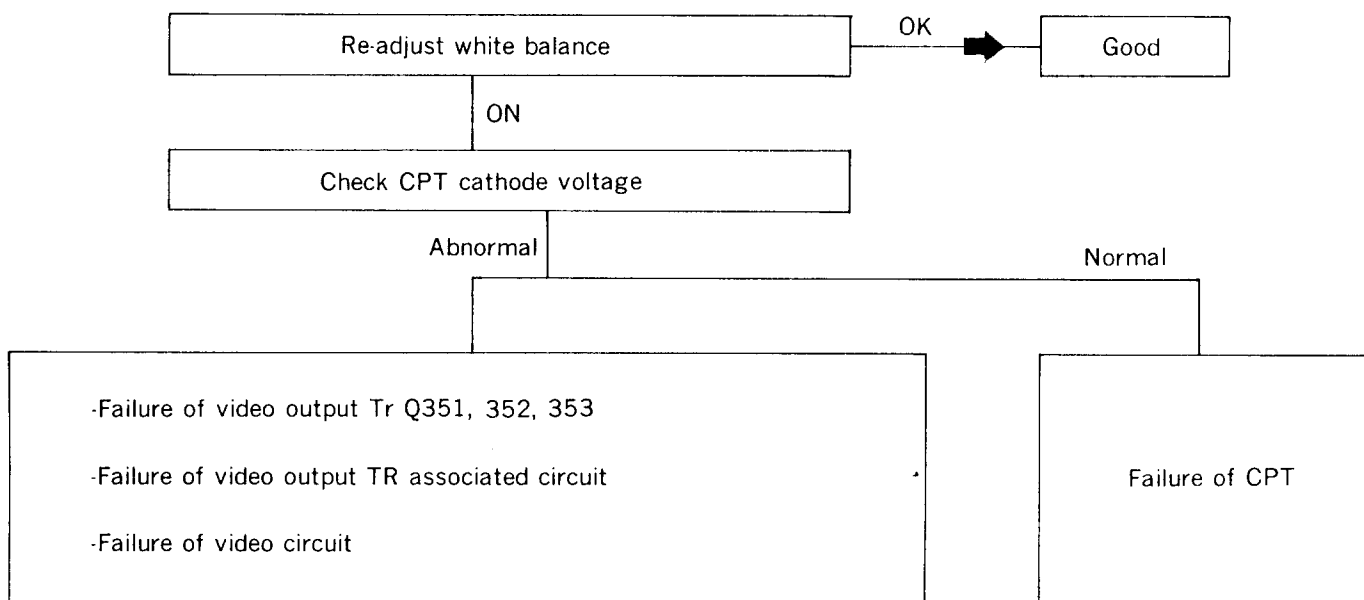
\* NOTE: Apply positive signal as input for RGB1 TTL



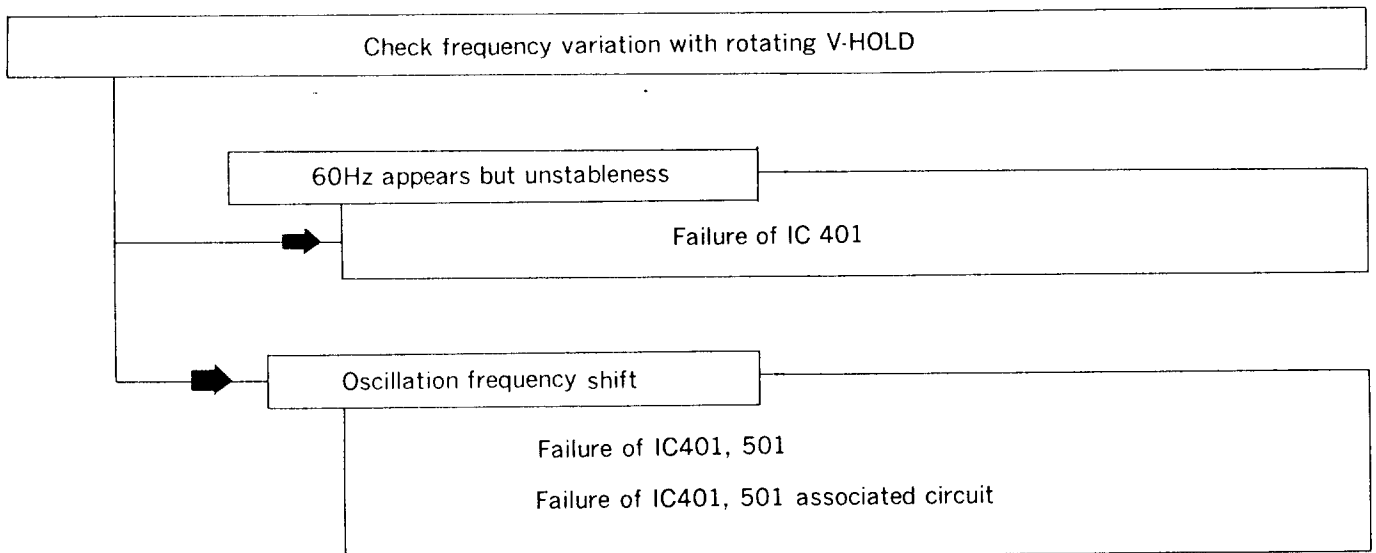
⑤ NO VERTICAL SWEEP



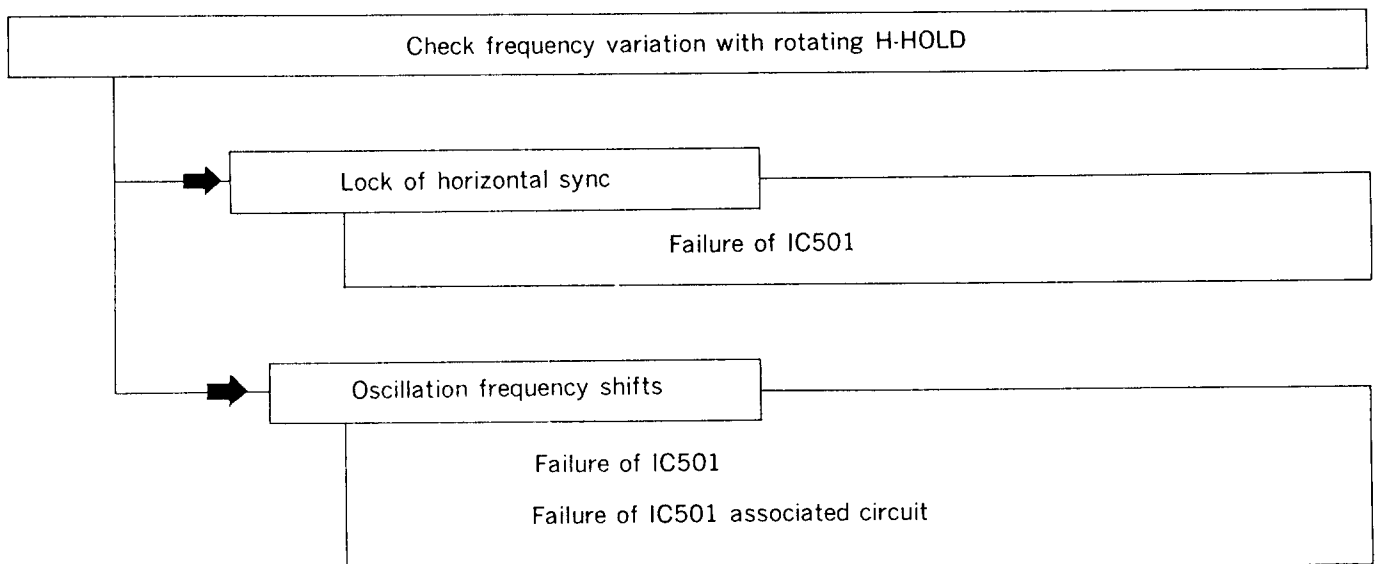
⑥ FAILURE OF WHITE BALANCE



⑦ UNSTABLE VERTICAL



⑧ UNSTABLE HORIZONTAL



## 2. TROUBLE SHOOTING FOR RESPECTIVE SYMPTOMS

### 2.1 NO RASTER

- ① Turn the brightness control clockwise fully. If raster does not appear, check up next item.
- ② Check CPT heater  
It is not on; CPT heater disconnect & failure heater of FBT  
OK; Proceed to next check item
- ③ Check high voltage by HV voltage meter  
High voltage is not obtained  
; Check of FBT (T501)  
Check of Q552 Collector  
Check of Q552 Base  
Check of HDT  
Check of pin4 IC501  
Check of pin3 of IC501  
OK ; Proceed to next check item
- ④ Check CPT electrode voltage as follow.  
G2 ;  $300 \pm 50V$   
G4 ;  $6K \pm 500V$   
G1 ;  $0V$   
K ;  $180 \pm 10V$   
Voltage of G2 and G4 are not obtained; check of T501.  
Voltage of K is not obtained; Check of video amp. and ambient circuit.  
Voltage of G2, G4, G1 and K are normal; CPT is faulty.  
OK ; Proceed to next check item.
- ⑤ Check AC voltage at AC input point on SMPS  
AC voltage abnormal; Failure of AC line  
OK ; Proceed to next check item
- ⑥ Check fuse F601  
Disconnected; Failure of switching power transformer.  
Failure of bridge diode  
Failure of degaussing circuit  
OK ; Proceed to next check item
- ⑦ Check DC output voltage  
Abnormal; Failure of IC601 and ambient circuit.  
OK ; Proceed to next check item.

### 2.2 ONLY ONE RASTER LINE APPEARS IN HORIZONTAL DIRECTION.

- ① Check of deflection yoke vertical coil; Vertical coil open and shorted.
- ② Check of pin 7 of IC501 when voltage is not obtained; Check of C451
- ③ Check of pin 2 of IC 401

### 2.3 UNSTABLE VERTICAL

- ① Check frequency variation with rotating V-Hold.
- ② Check of pin 7, 8, 9 of IC501.

### 2.4 UNSTABLE HORIZONTAL

- ① Check of frequency variation with rotating H-Hold.
- ② Check of pin 3 of IC501.

### 2.5 NO PICTURE

The nearly square pulses output of the oscillator applies it the base of Q551 to switch on and off this transistor, thereby passing pulse current through the primary side transformer (HDT).

With each turning on and off of the transistor spiking occur because of inductance.

The horizontal output transistor Q552 is simply a switch which is turned on and off at the horizontal scan rate by the driving signal applied to its base, a sawtooth current through the deflection coil is required to sweep the beam linearly across the CPT screen.

This happens when Q552 is turned on and its collector voltage droops to near zero, and the C556 begins discharging through the deflection coil which deflects the beam to the right edge of the CPT.

At that time, Q552 cuts off and C556 ceases to supply current to the deflection coil. However, an induced voltage appears across the deflection yoke coil as the magnetic field collapses and an oscillation then occurs the deflection coils and C556.

During the first half cycle of this oscillation, the induced voltage is felt across the collector of Q552 with cut off C556 and the primary T501.

This voltage is stepped up T501 rectified to produce high voltage that is applied to anode of the CPT.

## (3) SERVICE NOTE

Servicing precautions

The following precautions should be observed when service is required.

1. Replacement parts which have special safety characteristics are identified by shading on the schematics.  
Replace these critical components with recommended replacement parts.  
Don't degrade the safety of the set through improper servicing.
2. Comply with all cautions and safety-related notes on or inside the monitor cabinet, on the monitor chassis or on the picture tube.
3. Maintain correct lead dress and part placement.  
Extra caution should be taken to assure proper dress in the high voltage circuit area.  
Where a malfunction has occurred, those components or circuits that indicate evidence of abnormality should be replaced or corrected.  
Always use the manufacturer's safety specified replacement components.

4. When replace a chassis in the cabinet, always make certain that all the protective devices are back in thier proper place, such as: non metallic control knobs, insulating fishpapers, component cover/shields, isolation resister capacitor networks etc.

5. Before returning the monitor to the owner, be sure that no protective device built into the set by the manufacturer has become defective, or inadvertently defeated during servicing. Therefore, the following checks are recommended for the continued protection of the cutomer and service engineer.

\* LEAKAGE CURRENT HOT CHECK

Plug the AC line cord directly into a 115V AC outlet (do not use an isolation transformer in this check).

Use a leakage current tester which complies with American National Standars Institute (ANSI C101.1-1971, LEAKAGE FOR APPLIANCE), and UNDERWRITERS LABORATORIES (UL, 1410).

Meaure current form all the exposed metal parts of the cabinet, (screwheads, metal overlays, etc.) to earth ground, particularly any exposed metal part having a return path to the chassis.

The test should be conducted with AC switch "ON" and then repeated with "OFF".

Any current measured must not exceed 0.5mA with to AC line cord inserted in the AC supply circuit receptacle.

Any measurement not within the limits outlined above are indicative of a potential shock hazard and corrective action must be taken before returning the set to the customer.

6. X-RADIATION PRECAUTION

This product contains critical electrical and mechanical parts essential for X-RAY protection, see CRITICAL COMPONENT LIST and other service adjustment.

Anode voltage normal is 22.8KV at 115V line and must not exceed 28KV under any operating condition. To measure anode voltage, set brightness for a very dim picture.

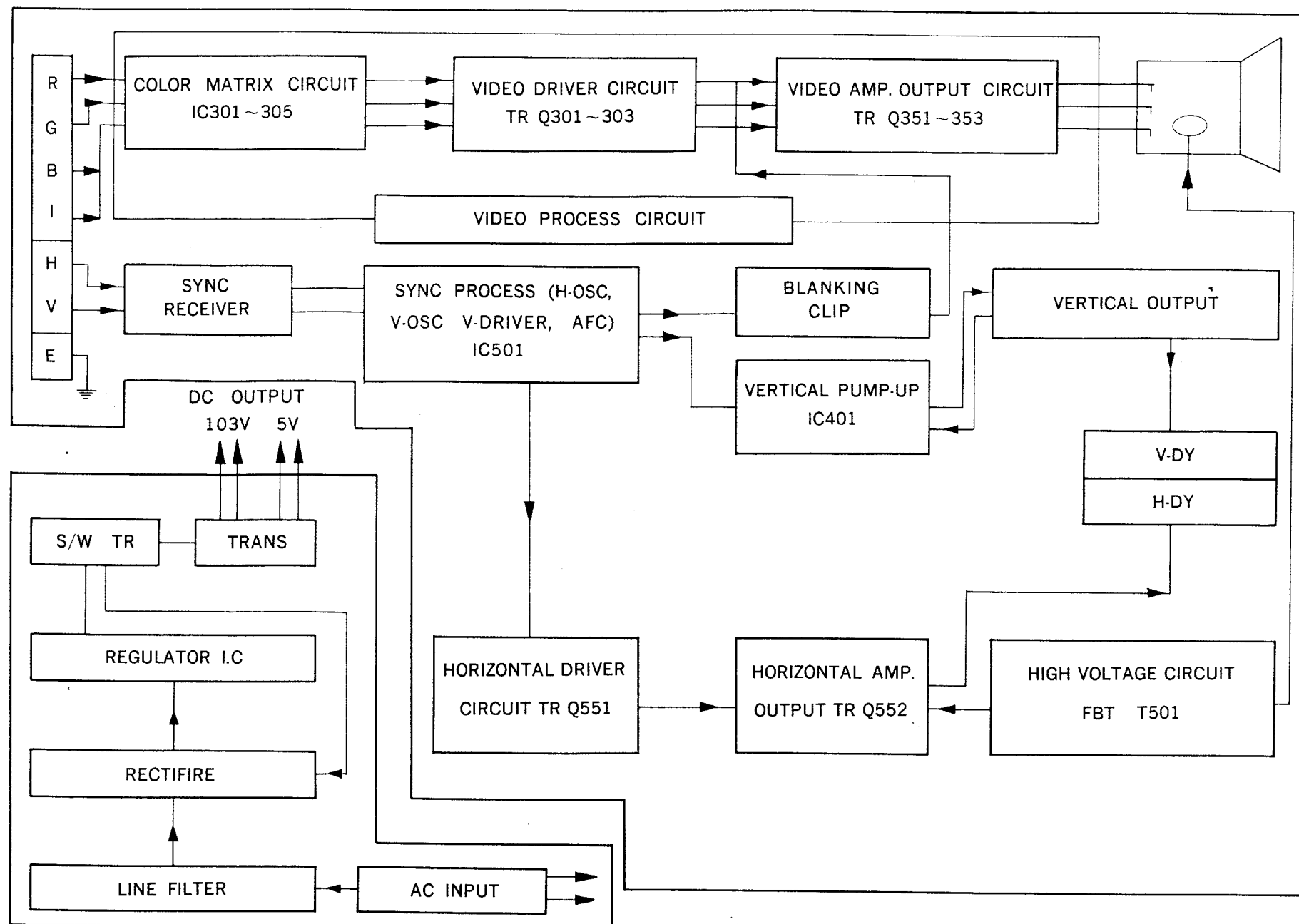
Use a high-voltage meter between the chassis and the anode lead to measure HV.

If high voltage exceeds the specified limits, check each components on the chassis and take necessary corrective action.

7. Do not remove, install or handle the picture tube in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away while a picture tube is handled.

Keep the picture tube away from body while handling.

[4] BLOCK DIAGRAM



# COMPONENT POWER DISSIPATION

## 1. IC

| No. | Circuit No | Description | Function | Test Data |        |        |           |  | Remark |
|-----|------------|-------------|----------|-----------|--------|--------|-----------|--|--------|
|     |            |             |          | $V_i$     | $V_o$  | $I_o$  | $P_{tot}$ |  |        |
| 1   | IC306      | L7805CV     | 5V REG.  | 9.3V      | 4.99V  | 67.8mA | 0.29W     |  |        |
| 2   | IC502      | L78S12CV    | 12V REG. | 14.9V     | 12.02V | 0.14A  | 0.4W      |  |        |
| 3   | IC301      | 74LS04      | TTL      | 4.99V     | -      | 31.2mA | -         |  |        |
| 4   | IC302      | 74LS06      | TTL      | 4.99V     | -      | 31.7mA | -         |  |        |
| 5   | IC303      | 74LS26      | TTL      | 4.99V     | -      | 4.4mA  | -         |  |        |
| 6   | IC305      | 74LS11      | TTL      | 4.99V     | -      | 6.6mA  | -         |  |        |

## 1. IC

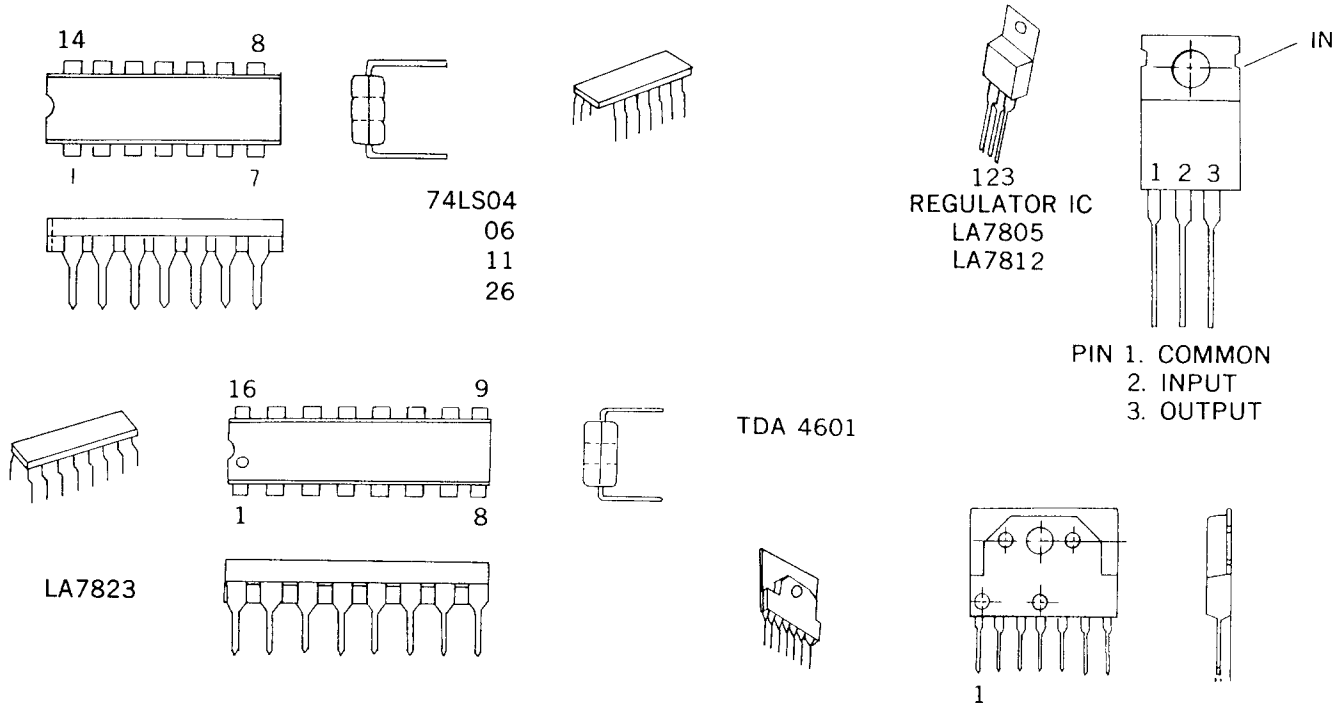
| No | Circuit No | Description | function                 | Test Data |          |            |          |       | Remark |
|----|------------|-------------|--------------------------|-----------|----------|------------|----------|-------|--------|
|    |            |             |                          | $V_{13}$  | $V_{16}$ | $I_{cc16}$ | $I_{o4}$ | $P_d$ |        |
| 1  | IC501      | LA7823      | Ver./Hor Process Circuit | 12.02V    | 12.65V   | 12.8mA     | 7.8mA    | 2.13W |        |
| 2  | IC401      | LA7830      | Vertical Pump-up Process | 24.3V     | 26.6V    | 0.66A      | 2.13W    |       |        |

## 2. TRANSISTOR

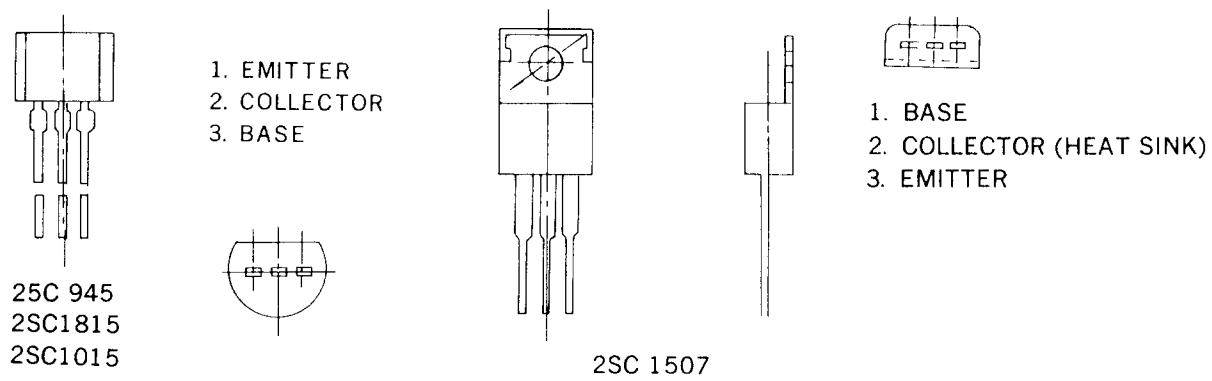
| No. | Circuit No    | Description | Function              | Test Data     |            |            | Remark |
|-----|---------------|-------------|-----------------------|---------------|------------|------------|--------|
|     |               |             |                       | $V_{CE0} (V)$ | $I_c (mA)$ | $P_c (mW)$ |        |
| 1   | Q301<br>~Q303 | 2SC1815     | Video Driver          | 17.36         | 16.34      | 154.9      |        |
| 2   | Q304          | "           | Contrast              | 15.54         | 32.70      | 159.6      |        |
| 3   | Q305          | "           | Circuit               | 16.60         | 8.60       | 86.89      |        |
| 4   | Q401,402      | "           | Blanking Clip Circuit | 8.42          | 1.82       | 15.35      |        |
| 5   | Q403          | 2SA1015     | Circuit               | 8.57          | 52.76      | 201.54     |        |
| 6   | Q351          | 2SC1507     | Video Amp             | 171.9         | 189        | 756        |        |
| 7   | Q352          | "           | "                     | 171.8         | 187        | 748        |        |
| 8   | Q353          | "           | "                     | 171.2         | 186        | 744        |        |
| 9   | Q551          | "           | H-Driver              | 167.0         | 99.40      | 346        |        |
| 10  | Q552          | 2SC1397     | H-Output              | 880           | 2.72       | 21.76W     |        |

# SEMICONDUCTORS BASING

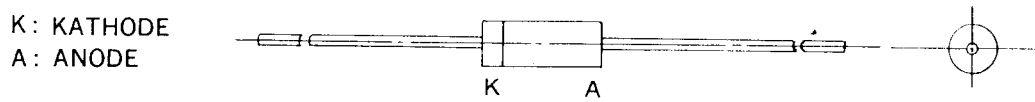
## IC



## TRANSISTOR



## DIODE



## **(5) THEORY OF OPERATION (CIRCUIT DESCRIPTION)**

### **1. General**

This monitor contains two independent circuits.

This first is the power supply section, and the second is the sweep or CPT drive section.

### **2. Power supply circuits**

LF601 and ambient capacitors from a line filter whose function is to protect the power supply from power line surges and noise, and to prevent the power supply from radiating noise back out to series with the degaussing coil which is across the AC line, initially, when the receiver is turned "on" and the resistance of the posistor is low.

Causing the current to flow through the degaussing coil and the demagnetizing action occurs at CPT.

As the posistor heats, its resistance increases to the point that the current flow through the degaussing coil becomes negligibility.

The TAD4601 has been controlled DC output voltage and has been designed for driving, controlling, and protecting the switching transistor in blocking converter power supplies.

At the input of pin 2 the zero crossings of the frequency provided by feedback coil (T602) are registered and forwarded to the control logic.

Pin 3 receives the rectified amplitude fluctuations of the feedback coil.

The regulating amplifier operates with an input voltage of approx. 2V and a current of approx. 1.4mA depending on the internal voltage reference, the overload recognition simulator pin 4 the operating range of the control amplifier.

The collector current is simulated by an external RC combination present at pin 4 and internally set threshold voltages.

The output levels of the control amplifier as well as those of the overload recognition and the collector current simulator are compared in the trigger and forwarded to the control logic.

Via pin 5 it is possible to externally inhibit the operation of the TDA4601.

### **3. Video section**

The section amplifies the output signal of the generator to a level high enough to drive the video output circuit.

Input signal contains R,G,B video signal and H.V sync. intensity.

These TTL level signals are positive polarity.

Video signal which applied to IC 301.302.303. 304.305 and driven via contrast volume, and connected Q301.302.303.

Finally, driven signals are applied to CPT cathode through output amplifier Q351.352.353.

The intensity signal which applied to IC301.303. 304 and driven signal is applied Q305.

When the level digital signal is 0, Q305 is cut off and emitter of Q304 is high level.

The intensity signal from Q304 applied to Q301. 302.303 and mixed R.G.B signal.

The socket board is a collection point for the voltage and signals required to operate the CPT.

The board contains bias and drive controls.

The R.G.B signal are directly coupled from amplifier of R.G.B main PCB.

### **4. Horizontal and vertical processor circuit**

The IC501 contains all the circuits for sync. separation, vertical oscillation, horizontal oscillation AFC and X-RAY protection.

The input signal applies first to the sync. separation circuit. and the sync. signals separated and taken out apply to the horizontal AFC and vertical sync. separation circuits.

VR401, R405, C403 connected to pin 10, provide the time constant in the vertical oscillation circuit, the frequency of oscillator can be varied by adjusting VR401.

The 60Hz signal, originating in the IC401, and amplified, comes to pin 6 and is then amplified further by the vertical output circuit.

The amplified 60Hz signal goes out through pin 2 of IC401 to vertical deflection yoke causing a sawtooth current to flow in the yoke coil.

The frequency of horizontal oscillation can be changed by means of VR502.

The pulses occurring in the secondary winding of FBT are admitted as the pulses for sawtooth wave generation through C502 of IC501.

These pulses under integration connected to pin 1 of IC501, and apply as comparison signal to the horizontal AFC circuit.

The voltage resulting from comparison and detection is taken out through pin (2), smoothed by C508, R508 and forwarded as the horizontal AFC voltage to the oscillation circuit.

The X-Ray protection circuit operates by shutting down the horizontal oscillator in reference to a voltage produced by rectifying the flyback pulses. This scheme, based on the proportionality between flyback pulses and high voltage, is put to work in the following manner.

Flyback pulses of positive polarity are rectified D551 and C551, and resulting DC voltage is applied to pin 5 of IC501.

When the high voltage exceeds the limit, the DC voltage will be high, so to shut down the horizontal oscillator.

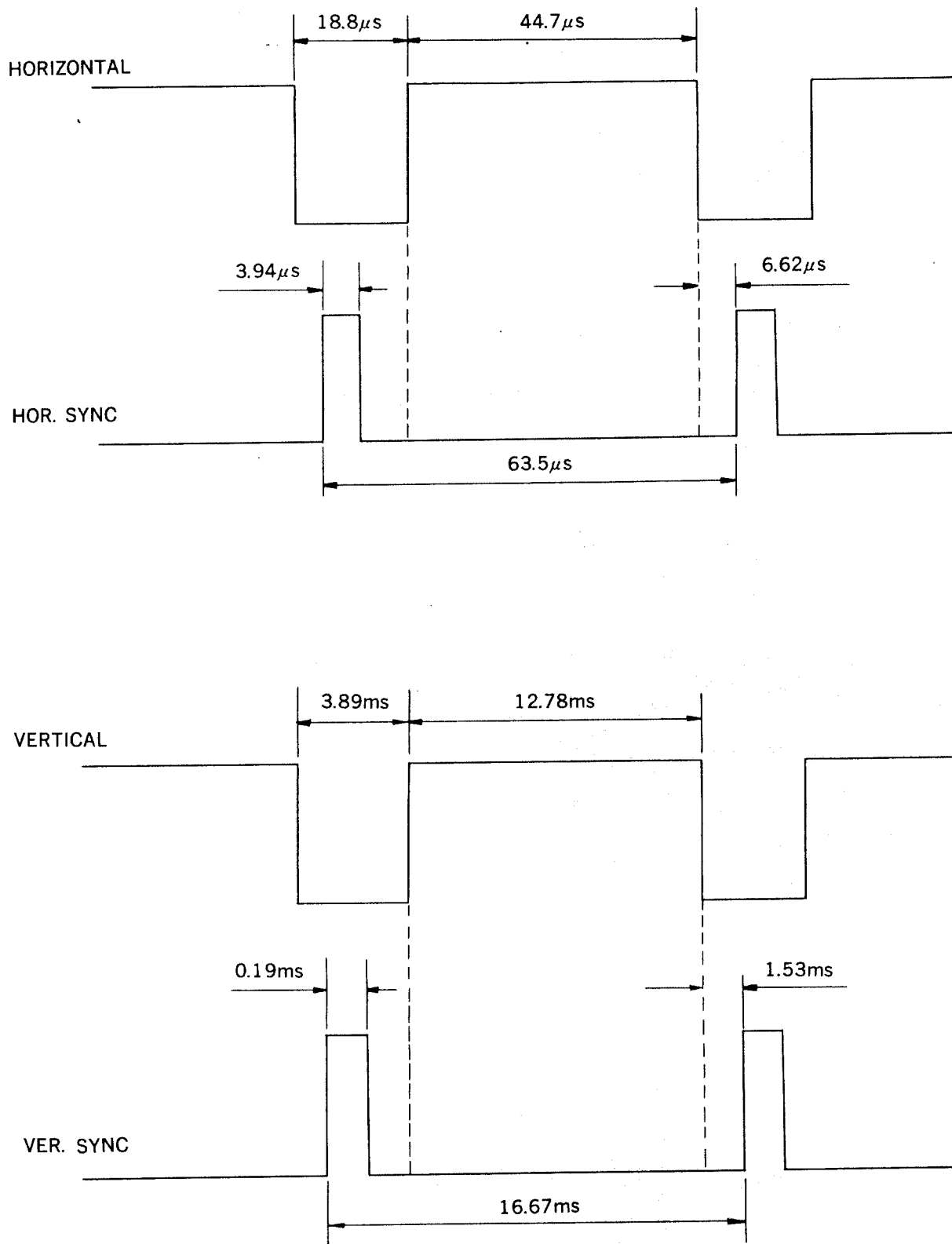
The loss of this oscillation in loss of raster, but the DC power supply remains unaffected. The Q550 and T551 is horizontal drive circuit.

This circuit is located oscillator circuit and horizontal output circuit and serves to amplify the output of the oscillator and to drive the output transistor.

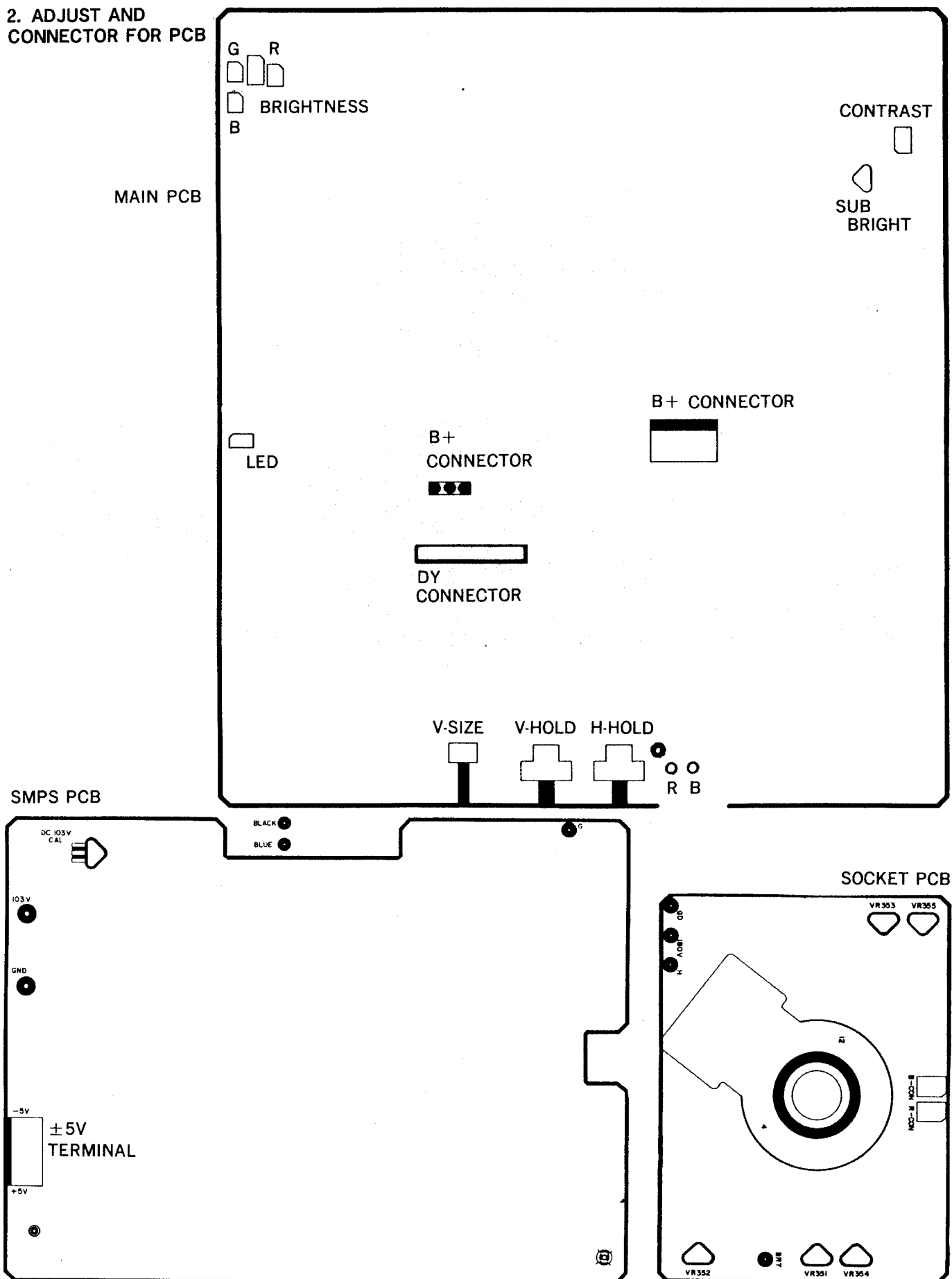
## SECTION III FIGURES

1. Timing chart
2. Adjust & Connector for PCB
3. Main PCB Ass'y dimension
4. Mechanical dimension for C.P.T
5. Schematic and Voltagewave form
6. PCB Component location

# I. TIMING CHART

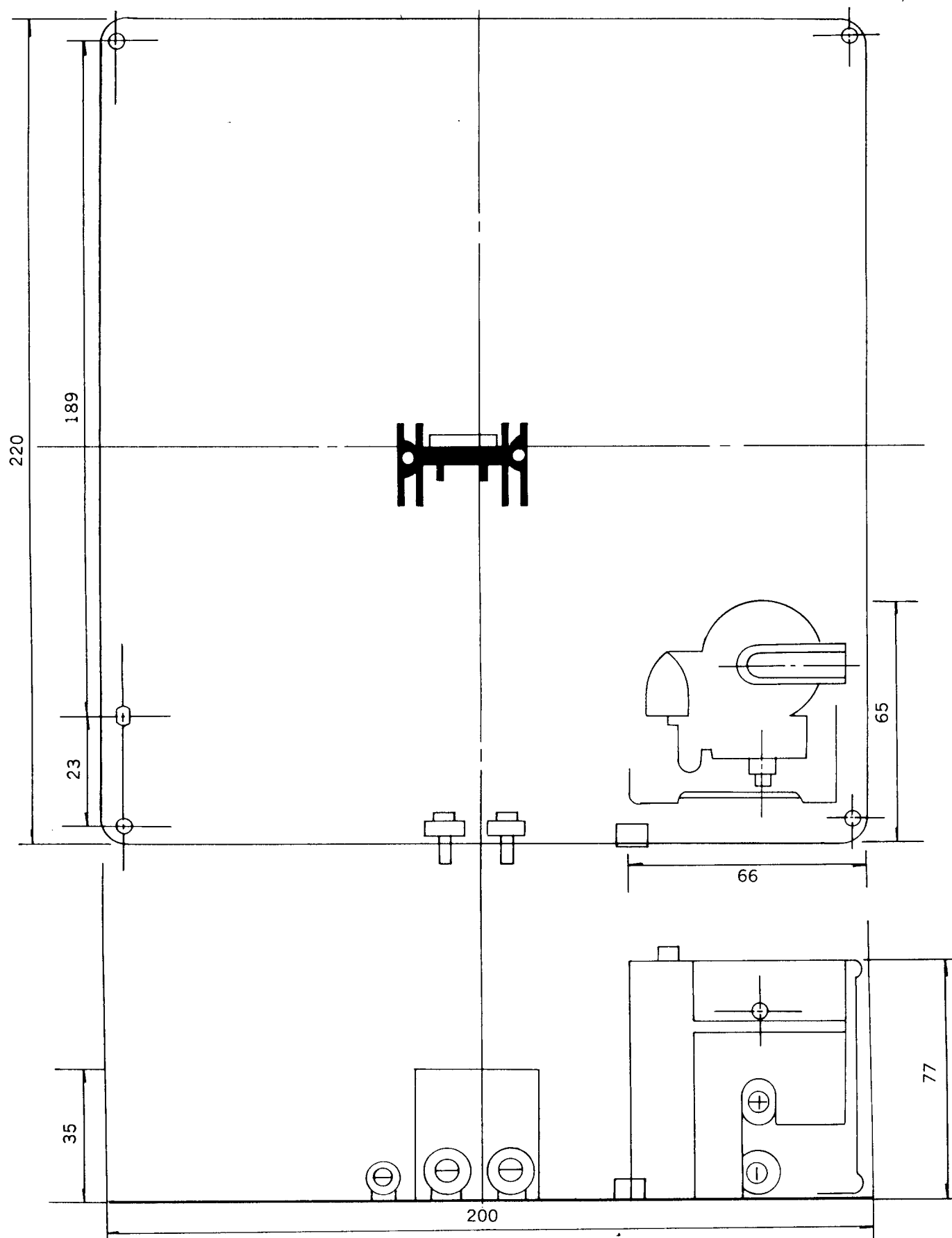


## 2. ADJUST AND CONNECTOR FOR PCB



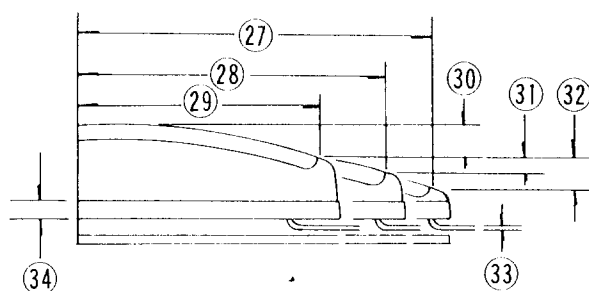
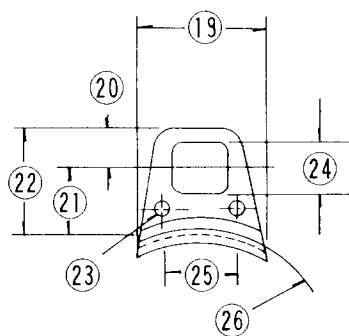
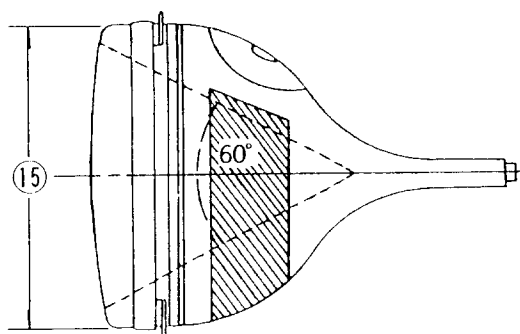
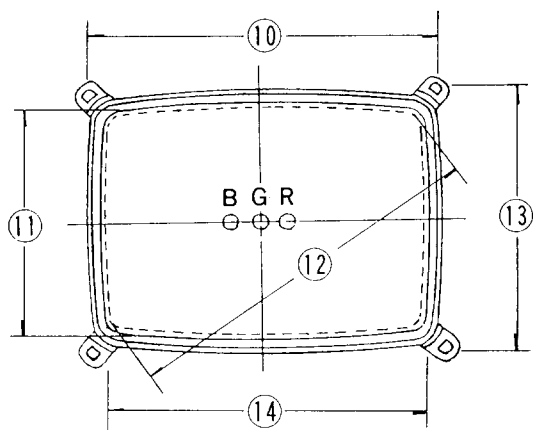
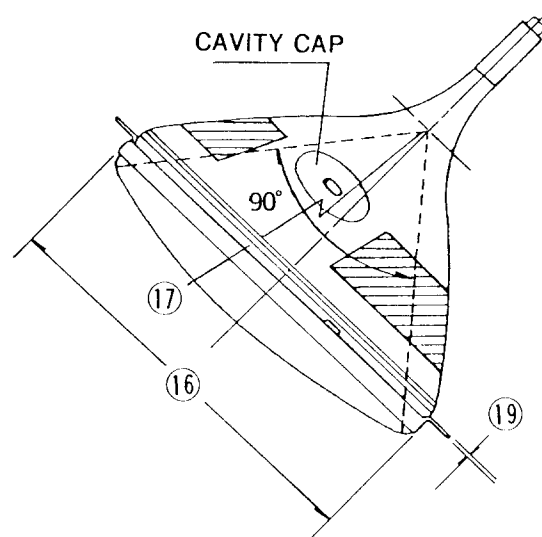
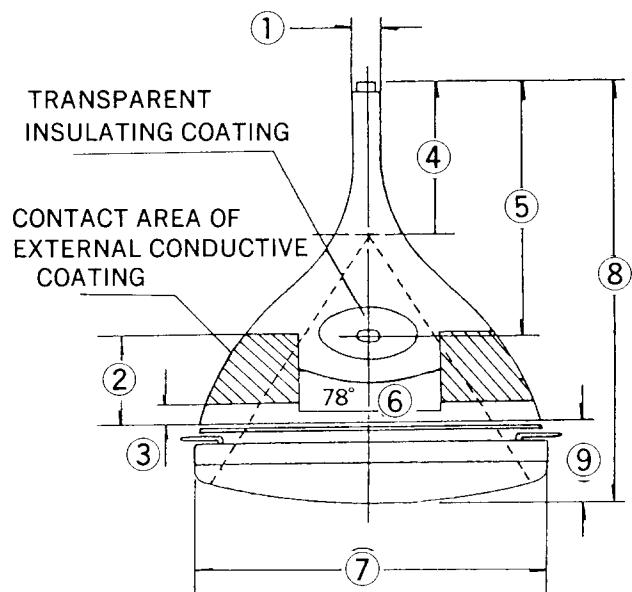
### 3. MAIN PCB ASS'Y DIMENSION

UNIT; MM



#### 4. MECHANICAL DIMENSION FOR CPT

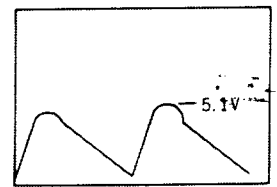
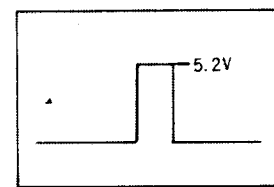
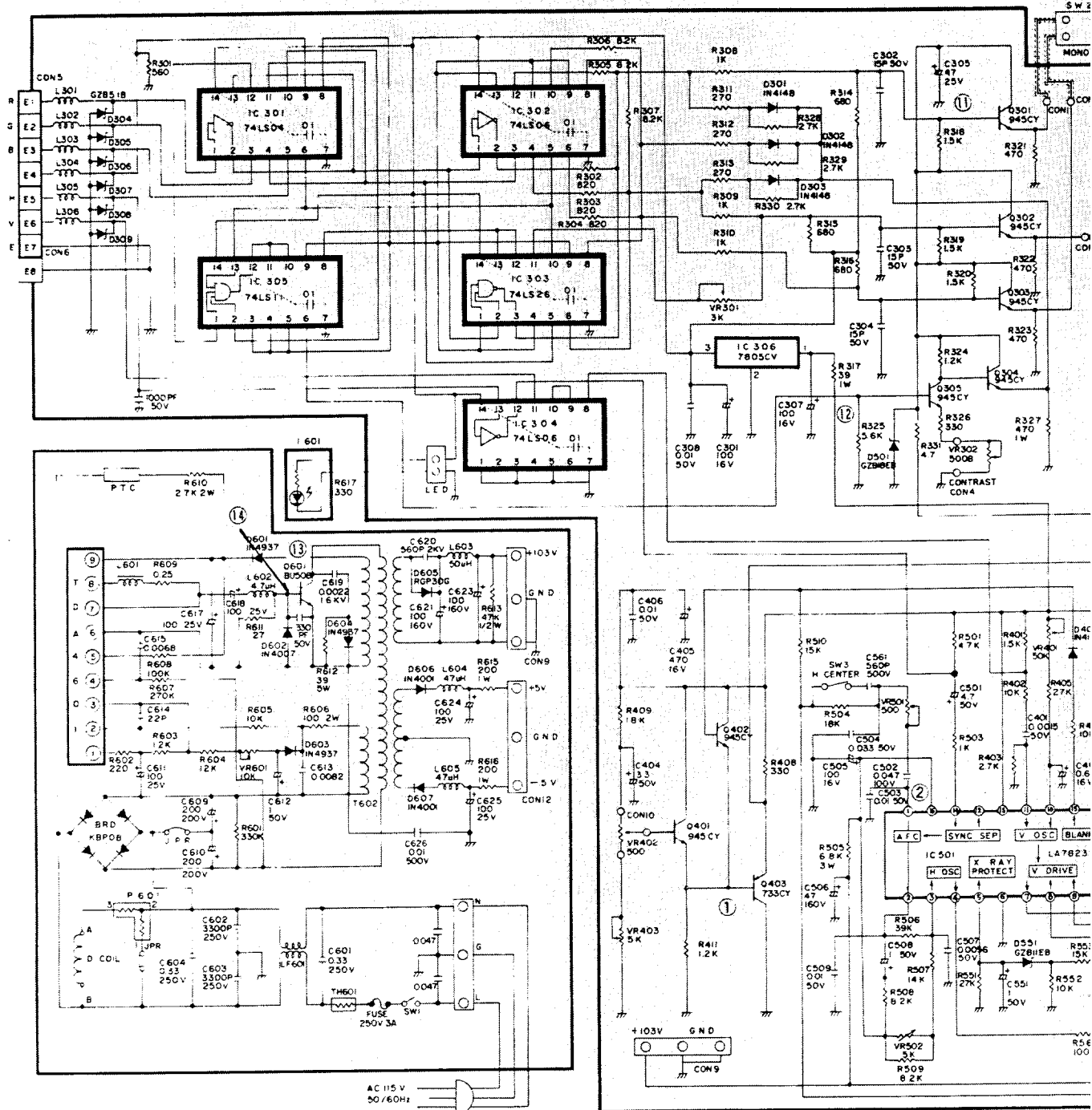
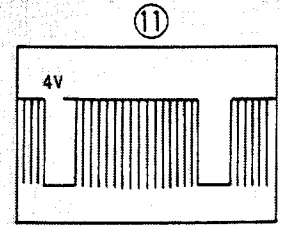
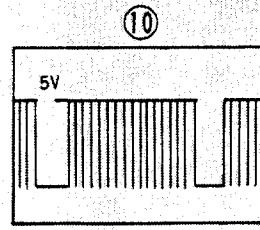
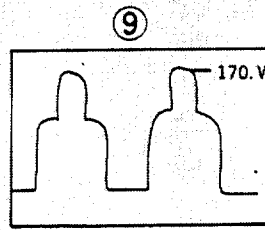
##### OUTLINE DRAWINGS



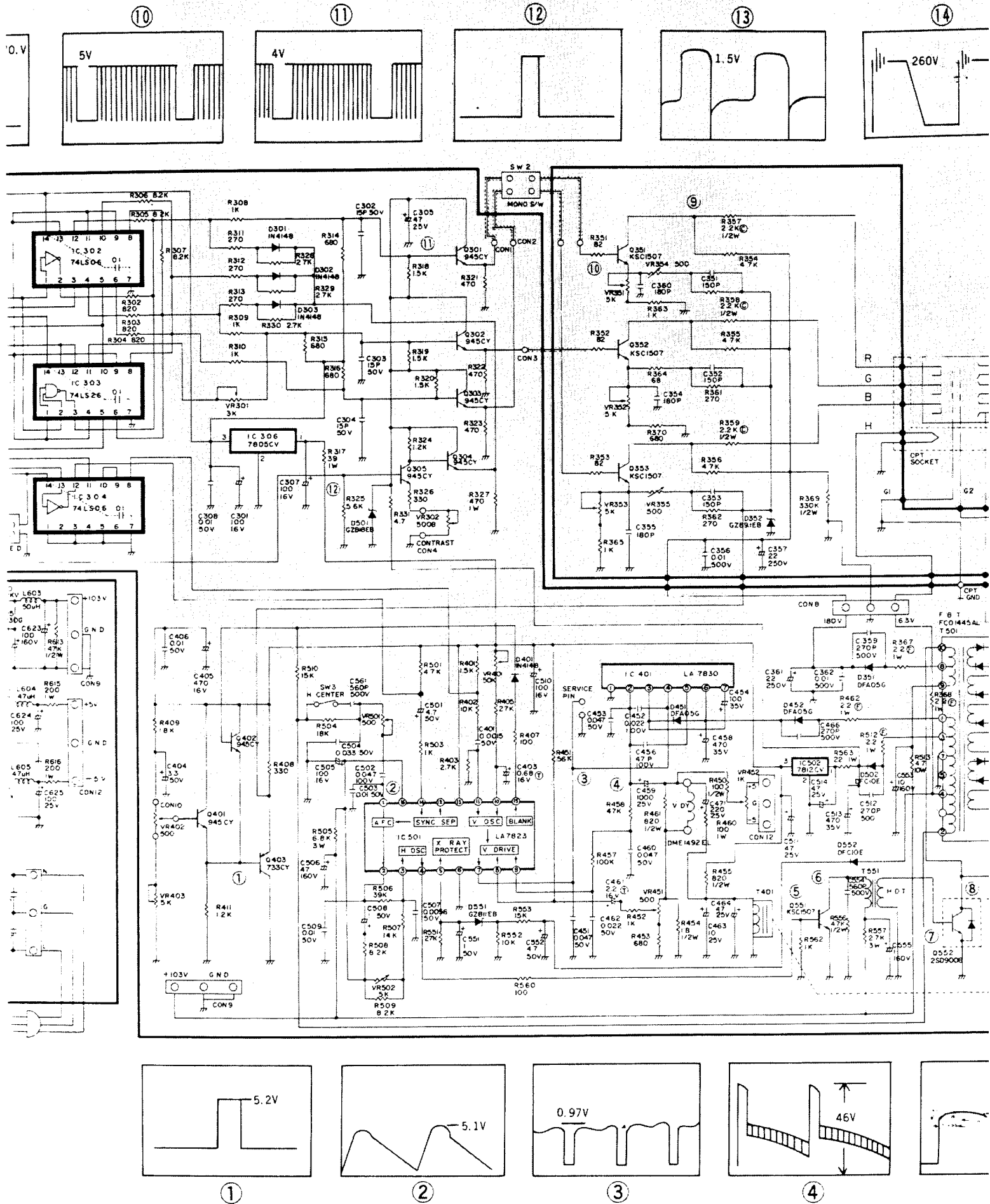
## Outline Dimensions

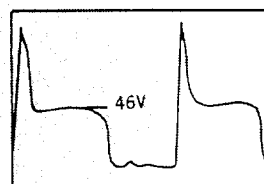
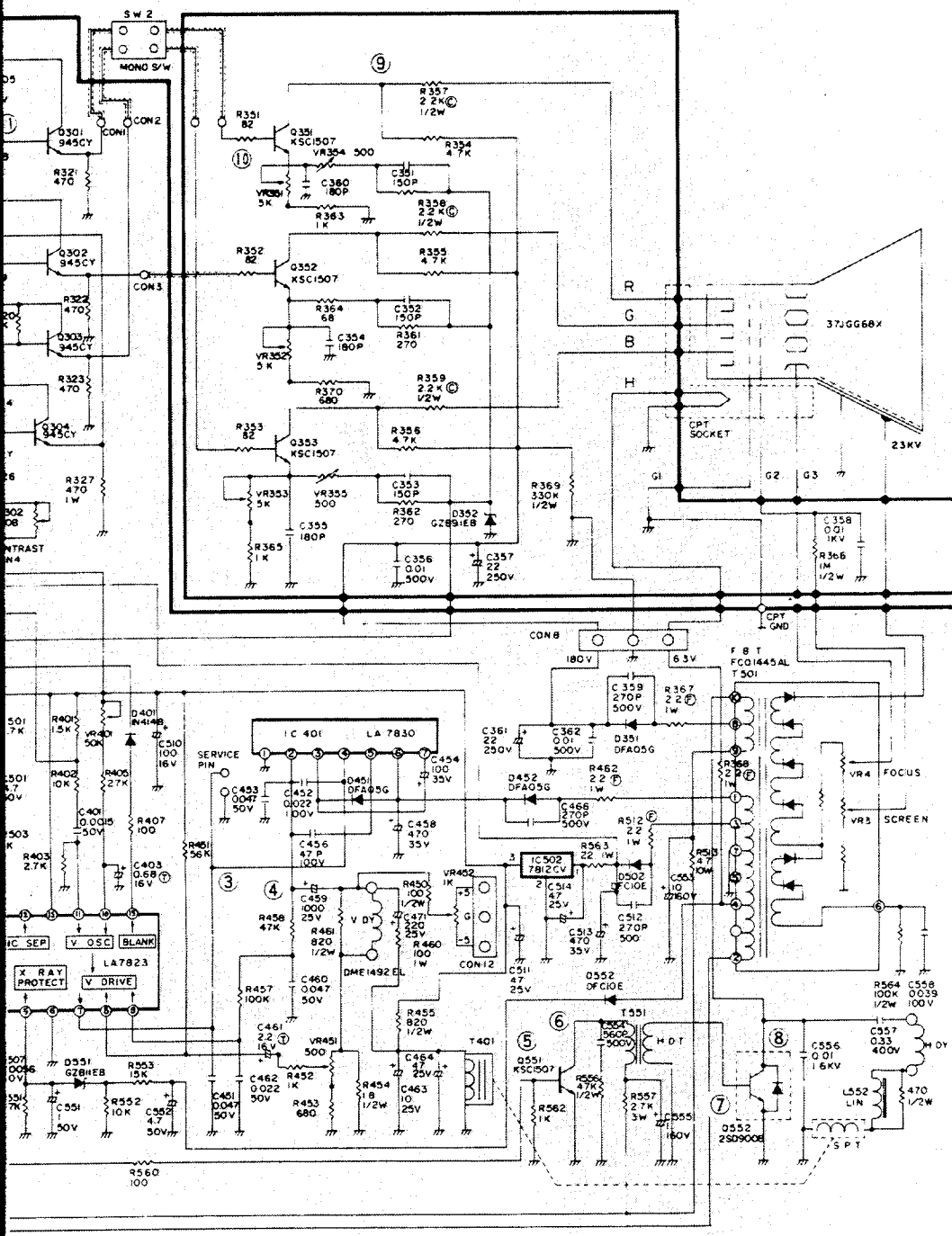
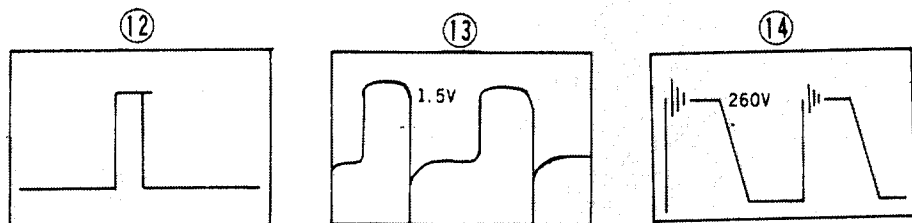
| Dimension Number | Dimension (inches/mm)                           | Dimension Number | Dimension (inches/mm)         |
|------------------|-------------------------------------------------|------------------|-------------------------------|
| 1                | $1.146^{+0.059}_{-0.026}/29.11^{+1.50}_{-0.66}$ | 18               | 0.078/2.0                     |
| 2                | 2.85min/72.5min                                 | 19               | 1.14/29                       |
| 3                | 1.16/29.5                                       | 20               | 0.29/7.5                      |
| 4                | $5.681 \pm 0.188/144.3 \pm 4.8$                 | 21               | 0.59/15                       |
| 5                | $8.45 \pm 0.314/214.6 \pm 8.0$                  | 22               | 1.00/25.4                     |
| 6                | 5.52/140.2                                      | 23               | $0.118\phi/3.0\phi$           |
| 7                | $12.47 \pm 0.12/316.8 \pm 3.0$                  | 24               | 0.55/14                       |
| 8                | $13.575 \pm 0.37/344.8 \pm 9.5$                 | 25               | 0.79/20.1                     |
| 9                | $2.83 \pm 0.09/72.0 \pm 2.4$                    | 26               | 1.06/27.12R                   |
| 10               | $12.25 \pm 0.12/311.4 \pm 3.0$                  | 27               | 6.72/170.9                    |
| 11               | 8.29min/210.6min                                | 28               | 5.65/143.6                    |
| 12               | 13.20min/335.4min                               | 29               | 4.27/108.5                    |
| 13               | $9.57 \pm 0.12/243.2 \pm 3.0$                   | 30               | 0.40/10.3                     |
| 14               | 11.05min/280.8min                               | 31               | 0.31/7.9                      |
| 15               | $9.78 \pm 0.12/248.5 \pm 3.0$                   | 32               | 0.61/15.7                     |
| 16               | $14.72 \pm 0.12/374.0 \pm 3.0$                  | 33               | $1.34 \pm 0.079/34.0 \pm 2.0$ |
| 17               | 22.64R/575R                                     | 34               | 0.74/19                       |

# 5. SCHEMATIC AND VOLTAGE V

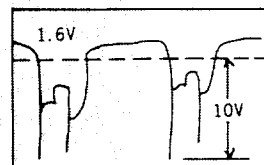


# 5. SCHEMATIC AND VOLTAGE WAVEFORM

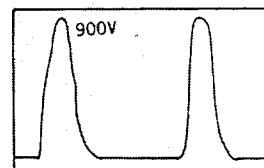




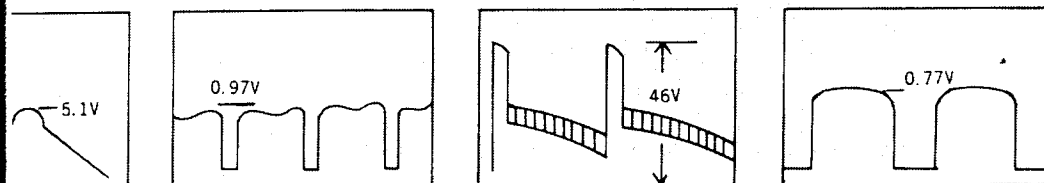
⑥



⑦



⑧

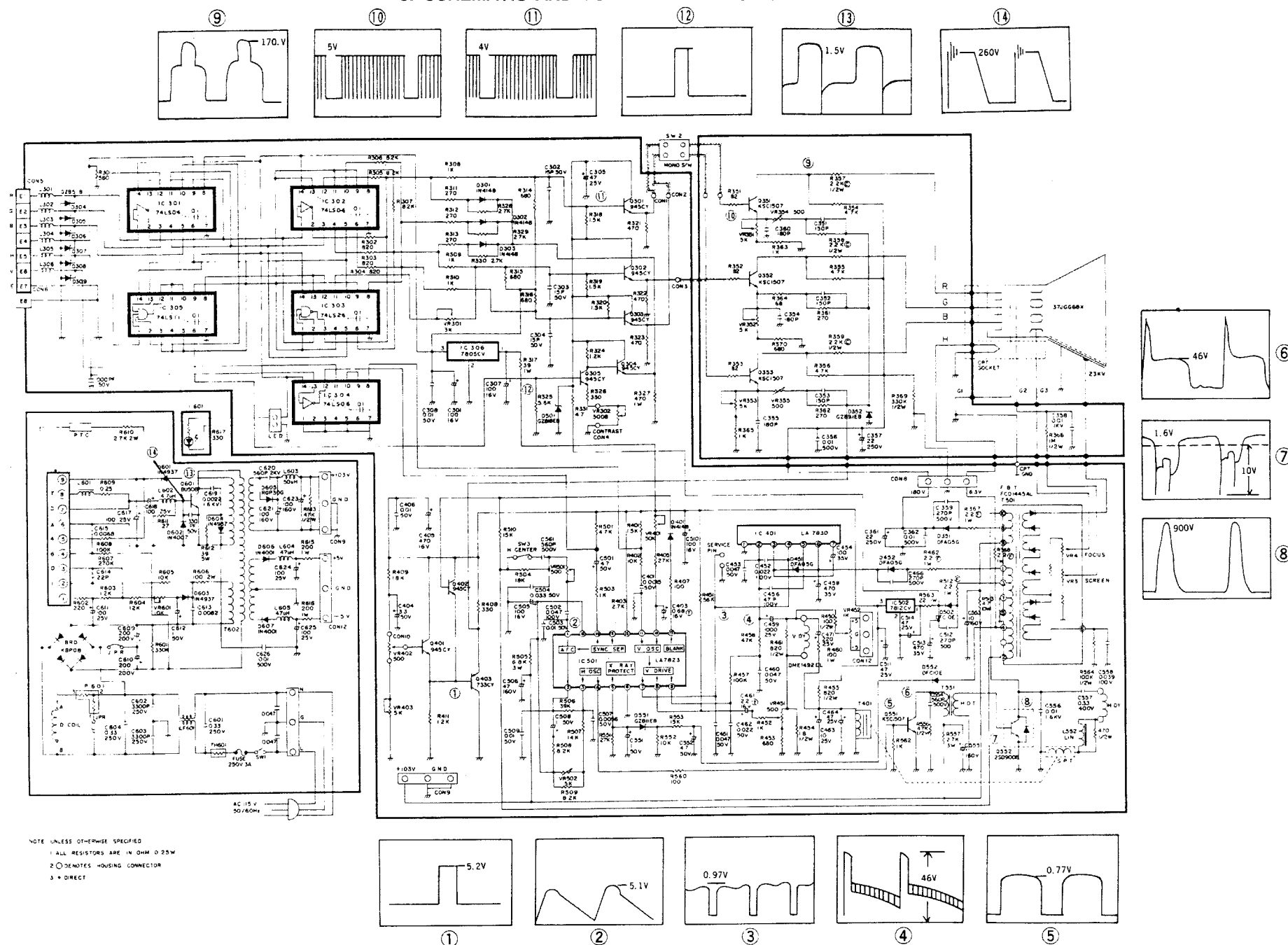


③

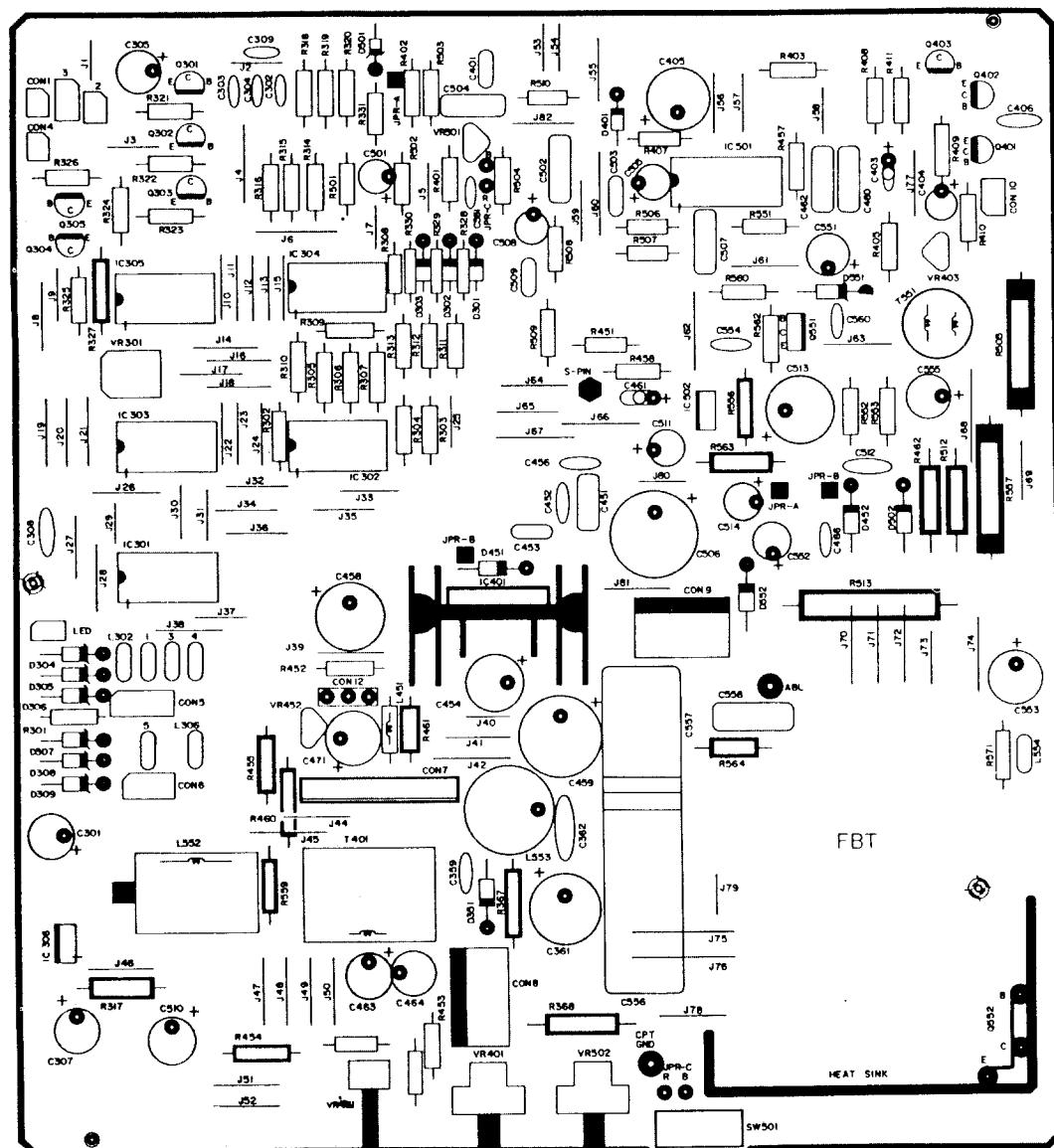
④

⑤

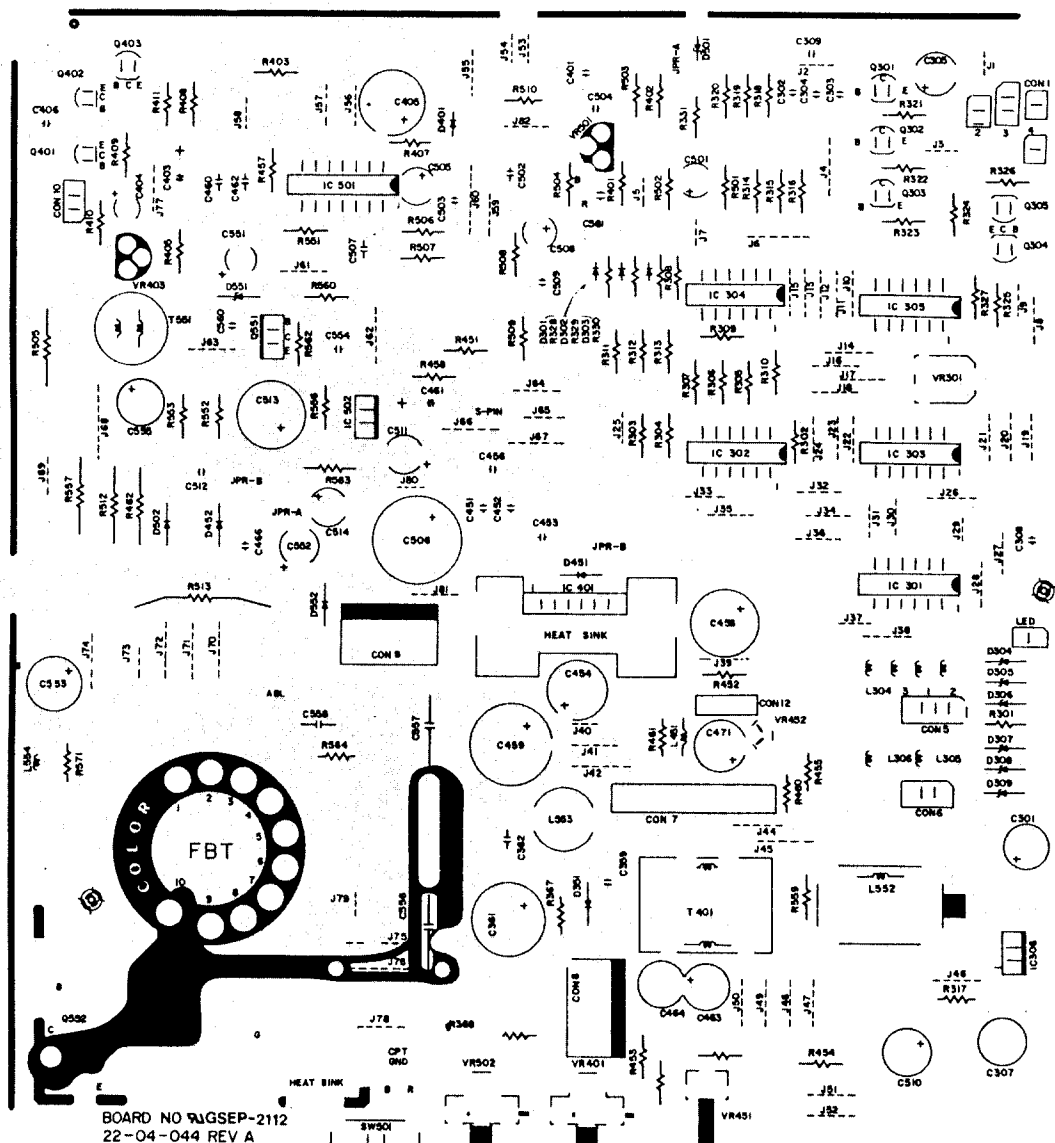
## 5. SCHEMATIC AND VOLTAGE WAVEFORM



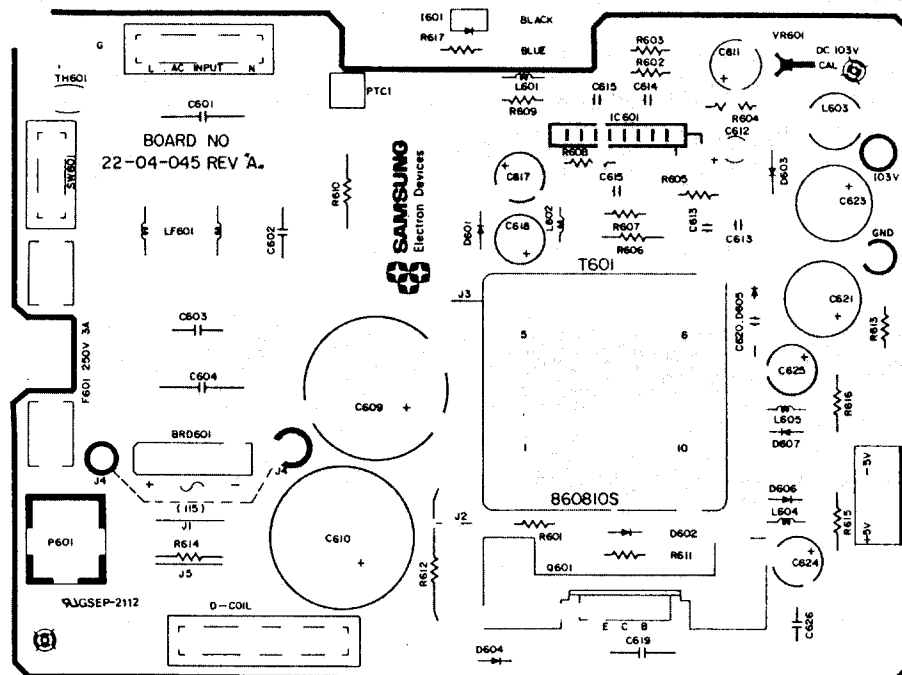
MAIN PCB



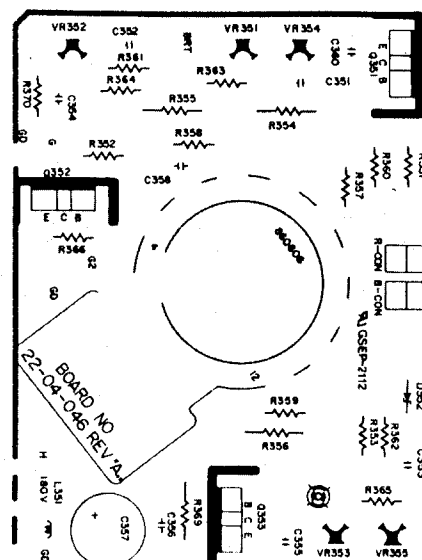
MAIN PCB



## SMPS PCB

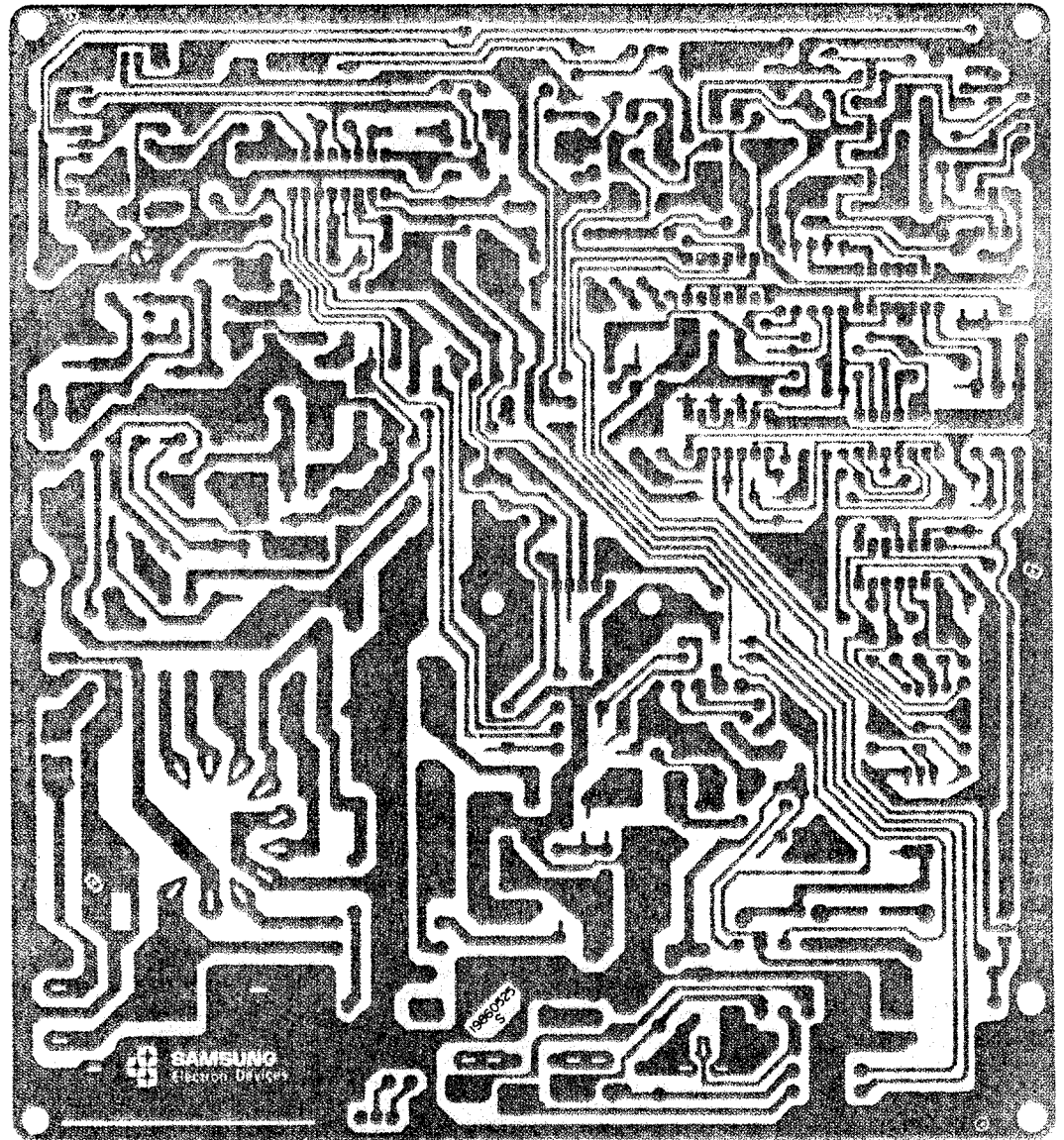


CPT SOCKET PCB

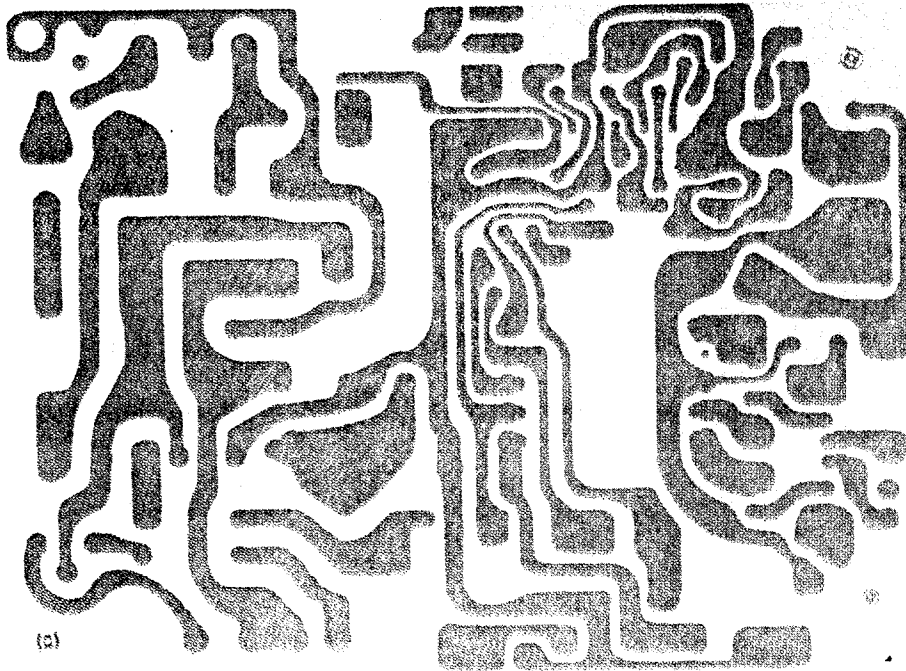


PCB LAND PATTERN  
DRAWING (BOTTOM)

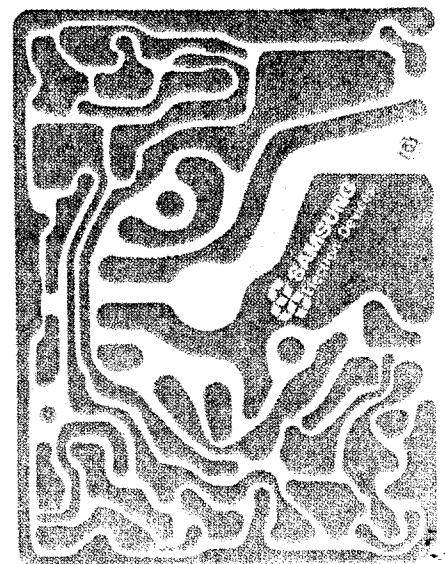
MAIN PCB



SMPS PCB



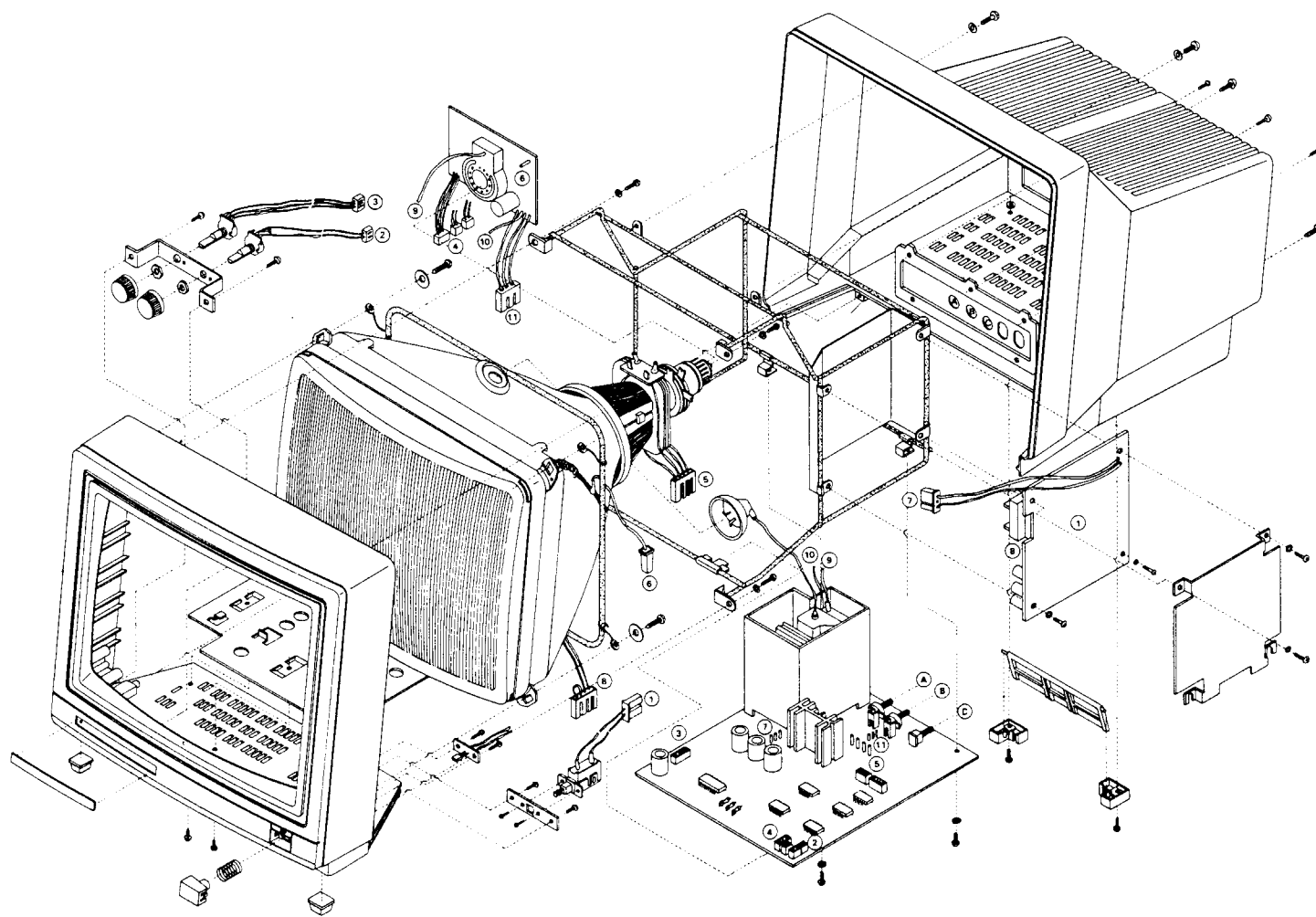
CPT SOCKET PCB



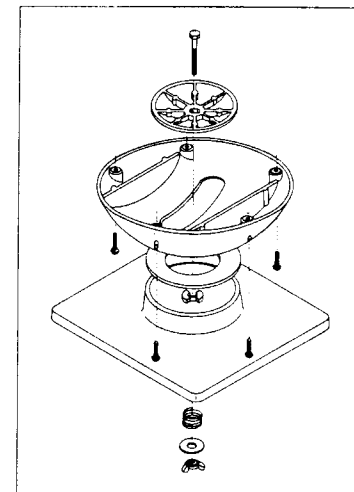
## **SECTION IV ATTACHMENTS**

1. Exploded view
2. Parts list

# ASSEMBLY DRAWING



OPTION



## PARTS LIST

| CKT NO. | SED.PART NO. | DESCRIPTION                        |
|---------|--------------|------------------------------------|
|         | 22-04-044    | Main P.C Board Blank FR-I (1.6t)   |
|         | 22-04-046    | Socket P.C Board Blank FR-I (1.6t) |
|         | 22-04-045    | SMPS P.C Board Blank FR-I (1.6t)   |
|         | G1-03-039    | Main P.C Board Ass'y FR-I (1.6t)   |
|         | 00-02-027    | Socket P.C Board Ass'y FR-I (1.6t) |
|         | G2-01-004    | SMPS P.C Board Ass'y FR-I (1.6t)   |

### MAIN PCB ASS'Y

#### RESISTIORS

|       |           |                                           |
|-------|-----------|-------------------------------------------|
| R301  | 14-04-561 | Resistor, carbon 560ohm 1/4W              |
| R302  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R303  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R304  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R305  | 14-04-822 | Resistor, carbon 8.2Kohm 1/4W             |
| R306  | 14-04-822 | Resistor, carbon 8.2Kohm 1/4W             |
| R307  | 14-04-822 | Resistor, carbon 8.2Kohm 1/4W             |
| R308  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R309  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R310  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R311  | 14-04-271 | Resistor, carbon 270ohm 1/4W              |
| R312  | 14-04-271 | Resistor, carbon 270ohm 1/4W              |
| R313  | 14-04-271 | Resistor, carbon 270ohm 1/4W              |
| R314  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R315  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R316  | 14-04-821 | Resistor, carbon 820ohm 1/4W              |
| R562  | 14-04-162 | Resistor, carbon 1Kohm 1/4W               |
| R563  | 14-09-220 | Resistor, metal oxide 22ohm 1W            |
| R564  | 14-05-104 | Resistor, carbon 100Kohm 1/2W             |
| VR301 | 15-02-021 | Variable, V-trimmer 3Kohm 0.2W            |
| VR401 | 15-03-013 | Variable, H-trimmer (W/Shaft) 50Kohm 0.2W |
| VR403 | 14-01-015 | Variable, H-trimmer (W/Shaft) 5Kohm 0.2W  |
| VR451 | 15-03-016 | Variable, H-trimmer (Handle) 500ohm 0.2W  |
| VR452 | 15-01-021 | Variable, H-trimmer (Handle) 1Kohm 0.2W   |
| VR501 | 15-01-026 | Variable, H-trimmer (Handle) 500ohm 0.2W  |
| VR502 | 15-033012 | Variable, H-trimmer (W/Shaft) 5Kohm 0.2W  |

#### CAPACITOR

|      |           |                                        |
|------|-----------|----------------------------------------|
| C301 | 16-04-014 | Electrolytic capacitor 100 $\mu$ F 16V |
| C302 | 16-11-009 | Ceramic capacitor 15pF 50V             |
| C303 | 16-11-009 | Ceramic capacitor 15pF 50V             |
| C304 | 16-11-009 | Ceramic capacitor 15pF 50V             |
| C305 | 16-04-006 | Electrolytic capacitor 47 $\mu$ F 25V  |
| C307 | 16-04-014 | Electrolytic capacitor 100 $\mu$ F 16V |
| C308 | 16-10-013 | Ceramic capacitor 0.01 $\mu$ F 50V     |
| C359 | 16-11-012 | Ceramic capacitor 270pF 500V           |
| C361 | 16-01-074 | Electrolytic capacitor 22 $\mu$ F 250V |
| C362 | 16-10-046 | Ceramic capacitor 0.01 $\mu$ F 500V    |
| C401 | 16-21-001 | Polyester capacitor 0.0015 $\mu$ F 50V |
| C403 | 16-12-014 | Tantal capacitor 0.68 $\mu$ F 16V      |
| C404 | 16-04-002 | Electrolytic capacitor 3.3 $\mu$ F 50V |
| C405 | 16-01-070 | Electrolytic capacitor 470 $\mu$ F 16V |
| C406 | 16-19-013 | Ceramic capacitor 0.01 $\mu$ F 50V     |
| C451 | 16-21-011 | Polyester capacitor 0.0039 $\mu$ F 50V |
| C452 | 16-11-003 | Ceramic capacitor 330 $\mu$ F 100V     |
| R453 | 14-04-471 | Resistor, carbon 1Kohm 1/4W            |
| R454 | 14-06-018 | Resistor, carbon 1.8ohm 1/4W           |
| R455 | 14-06-821 | Resistor, carbon 820ohm 1/2W           |
| R457 | 14-04-104 | Resistor, carbon 100Kohm 1/4W          |
| R458 | 14-04-473 | Resistor, carbon 47Kohm 1/4W           |
| R460 | 14-09-101 | Resistor, metal oxide 100ohm 1W        |
| R461 | 14-05-821 | Resistor, metal oxide 820ohm 1/2W      |
| R462 | 14-30-018 | Resistor, metal oxide 2.2ohm 1W        |
| R501 | 14-04-72  | Resistor, carbon 4.7Kohm 1/4W          |
| R502 | 14-04-154 | Resistor, carbon 150Kohm 1/4W          |
| R503 | 14-04-102 | Resistor, carbon 1Kohm 1/4W            |
| R504 | 14-04-183 | Resistor, carbon 18Kohm 1/4W           |
| R505 | 14-11-682 | Resistor, metal oxide 6.8Kohm 3W       |
| R506 | 14-04-393 | Resistor, carbon 39Kohm 1/4W           |
| R507 | 14-04-143 | Resistor, carbon 14Kohm 1/4W           |
| R508 | 14-04-822 | Resistor, carbon 8.2Kohm 1/4W          |
| R509 | 14-04-822 | Resistor, carbon 8.2Kohm 1/4W          |
| R510 | 14-04-153 | Resistor, carbon 15Kohm 1/4W           |
| R512 | 14-30-018 | Resistor, fusible 2.2ohm 1W            |
| R513 | 14-27-005 | Resistor, cement 4.7ohm 10W            |

|      |            |                                            |
|------|------------|--------------------------------------------|
| R551 | 14-04-273  | Resistor, carbon 27Kohm 1/4W               |
| R552 | 14-04-103  | Resistor, carbon 10Kohm 1/4W               |
| R553 | 14-04-153  | Resistor, carbon 15Kohm 1/4W               |
| R556 | 14-06-472  | Resistor, carbon 4.7Kohm 1/2W              |
| R557 | 14-11-272  | Resistor, metal oxide 2.7Kohm 3W           |
| R559 | 14-06-222  | Resistor, carbon 2.2Kohm 1/2W              |
| R560 | 14-04-101  | Resistor, carbon 100ohm 1/2W               |
| R561 | 14-04-101  | Resistor, carbon 100ohm 1/4W               |
| R317 | 14-09-390  | Resistor, carbon 39ohm 1W                  |
| R318 | 14-04-151  | Resistor, carbon 1.5Kohm 1/4W              |
| R319 | 14-04-152  | Resistor, carbon 1.5Kohm 1/4W              |
| R320 | 14-04-152  | Resistor, carbon 1.5Kohm 1/4W              |
| R321 | 14-04-471  | Resistor, carbon 470ohm 1/4W               |
| R322 | 14-04-471  | Resistor, carbon 470ohm 1/4W               |
| R323 | 14-04-471  | Resistor, carbon 470ohm 1/4W               |
| R324 | 14-04-122  | Resistor, carbon 1.2Kohm 1/4W              |
| R325 | 14-04-562  | Resistor, carbon 5.6Kohm 1/4W              |
| R326 | 14-04-331  | Resistor, carbon 330ohm 1/4W               |
| R327 | 14-09-471  | Resistor, metal oxide 470ohm 1W            |
| R328 | 14-04-272  | Resistor, carbon 2.7Kohm 1/4W              |
| R329 | 14-04-272  | Resistor, carbon 2.7Kohm 1/4W              |
| R330 | 14-04-272  | Resistor, carbon 2.7Kohm 1/4W              |
| R331 | 14-04-047  | Resistor, carbon 4.7ohm 1/4W               |
| R367 | 14-30-016  | Resistor, fusible 2.2ohm 1W                |
| R368 | 14-30-017  | Resistor, fusible 2.2ohm 1W                |
| R401 | 14-04-152  | Resistor, carbon 1.5Kohm 1/4W              |
| R402 | 14-04-103  | Resistor, carbon 10Kohm 1/4W               |
| R403 | 14-04-272  | Resistor, carbon 2.7Kohm 1/4W              |
| R405 | 14-04-273  | Resistor, carbon 27Kohm 1/4W               |
| R407 | 14-04-101  | Resistor, carbon 100ohm 1/4W               |
| R408 | 14-04-331  | Resistor, carbon 33ohm 1/4W                |
| R409 | 14-04-182  | Resistor, carbon 1.8Kohm 1/4W              |
| R410 | 14-04-561  | Resistor, carbon 560ohm 1/4W               |
| R411 | 14-04-122  | Resistor, carbon 1.24ohm 1/4W              |
| R451 | 14-04-563  | Resistor, carbon 56Kohm 1/4W               |
| R452 | 14-04-102  | Resistor, carbon 1Kohm 1/4W                |
| C453 | 16-21-003  | Polyester capacitor 0.01 $\mu$ F 50V       |
| C454 | 16-01-077  | Electrolytic capacitor 100 $\mu$ F 35V     |
| C456 | 16-11-029  | Ceramic capacitor 47pF 100V                |
| C458 | 16-01-078  | Electrolytic capacitor 470 $\mu$ F 35V     |
| C459 | 16-01-072  | Electrolytic capacitor 1000 $\mu$ F 25V    |
| C461 | 16-12-008  | Tantal capacitor 2.2 $\mu$ F 16V           |
| C460 | 16-21-006  | Polyester capacitor 0.047 $\mu$ F 50V      |
| C462 | 16-21-012  | Polyester capacitor 0.022 $\mu$ F 50V      |
| C463 | 16-04-004  | Electrolytic capacitor 10 $\mu$ F 25V      |
| C464 | 16-04-006  | Electrolytic capacitor 47 $\mu$ F 25V      |
| C466 | 16-11-012  | Ceramic capacitor 270pF 500V               |
| C471 | 16-01-021  | Electrolytic capacitor 220 $\mu$ F 25V     |
| C501 | 16-04-013  | Electrolytic capacitor 4.7 $\mu$ F 50V     |
| C502 | 16-15-036  | Polyester capacitor 0.047 $\mu$ F 100V     |
| C503 | 16-15-033  | Mylar capacitor 0.01 $\mu$ F 50V           |
| C504 | 16-15-002  | Polypropylene capacitor 0.033 $\mu$ F 50V  |
| C505 | 16-04-014  | Electrolytic capacitor 100 $\mu$ F 16V     |
| C506 | 16-01-076  | Electrolytic capacitor 47 $\mu$ F 160V     |
| C507 | 16-154-032 | Polupropylene capacitor 0.0056 $\mu$ F 50V |
| C508 | 16-04-001  | Electrolytic capacitor 1 $\mu$ F 50V       |
| C509 | 16-04-003  | Polyster capacitor 0.01 $\mu$ F 50V        |
| C510 | 16-04-014  | Electrolytic capacitor 100 $\mu$ F 16V     |
| C511 | 16-11-006  | Electrolytic capacitor 47 $\mu$ F 25V      |
| C512 | 16-01-012  | Ceramic capacitor 270 $\mu$ F 500V         |
| C513 | 16-04-078  | Electrolytic capacitor 470 $\mu$ F 35V     |
| C514 | 16-04-006  | Electrolytic capacitor 47 $\mu$ F 25V      |
| C551 | 16-04-001  | Electrolytic capacitor 1 $\mu$ F 50V       |
| C552 | 16-04-013  | Electrolytic capacitor 4.7 $\mu$ F 50V     |
| C553 |            |                                            |
| C554 | 16-11-014  | Ceramic capacitor 560pF 500V               |
| C555 | 16-01-051  | Electrolytic capacitor 1 $\mu$ F 160V      |
| C556 | 16-15-035  | Polypropylene capacitor 0.01 $\mu$ F 1.6KV |
| C557 | 16-25-020  | Metalizd paper capacitor 0.33 $\mu$ F 200V |
| C558 | 16-13-039  | Mylar capacitor 0.039 $\mu$ F 100V         |
| C561 | 16-10-043  | Ceramic capacitor 330pF 1KV                |

#### I.C

|       |           |                       |
|-------|-----------|-----------------------|
| IC301 | 20-01-007 | TTL IC(DIP-14) 74LS04 |
| IC302 | 20-01-035 | TTL IC(DIP-14) 74LS06 |
| IC303 | 20-01-036 | TTL IC(DIP-14) 74LS26 |
| IC304 | 20-01-035 | TTL IC(DIP-14) 74LS06 |
| IC305 | 20-10-037 | TTL IC(DIP-14) 74LS11 |
| IC306 | 20-03-016 | Regulator IC L7805CV  |
| IC501 | 20-06-011 | Linear IC LA7823      |
| IC502 | 20-03-033 | Regulator IC L78S12CV |

## TRANSISTOR

|      |           |                          |
|------|-----------|--------------------------|
| Q301 | 18-04-003 | NPN, Transistor KSC945CY |
| Q302 | 18-04-003 | NPN, Transistor KSC945CY |
| Q303 | 18-04-003 | NPN, Transistor KSC945CY |
| Q304 | 18-04-003 | NPN, Transistor KSC945CY |
| Q305 | 18-04-003 | NPN, Transistor KSC945CY |
| Q402 | 18-04-003 | NPN, Transistor KSC945CY |
| Q403 | 18-05-001 | PNP, Transistor KSA733CY |
| Q551 | 18-07-016 | NPN, Transistor KSC1507Y |

## DIODE

|      |           |                                 |
|------|-----------|---------------------------------|
| D301 | 19-03-004 | Switching diode IN4148          |
| D302 | 19-03-004 | Switching diode IN4148          |
| D303 | 19-03-004 | Switching diode IN4148          |
| D304 | 18-05-018 | Zener diode GZB 5,18            |
| D305 | 18-05-018 | Zener diode GZB 5,18            |
| D306 | 18-05-018 | Zener diode GZB 5,18            |
| D307 | 18-05-018 | Zener diode GZB 5,18            |
| D308 | 18-05-018 | Zener diode GZB 5,18            |
| D309 | 18-05-018 | Zener diode GZB 5,18            |
| D351 | 19-03-021 | Fast recovery diode(FRD) DFA05G |
| D401 | 19-03-004 | Switching diode IN4148          |
| D451 | 19-03-021 | FRD DFA05G                      |
| D452 | 19-03-021 | FRD DFA05G                      |
| D501 | 19-05-020 | Zener diode DZB18EB             |
| D502 | 19-03-022 | FRD DFC10E                      |
| D551 | 19-05-019 | Zener diode GZB11EB             |
| D552 | 19-02-022 | FRD DFC10E                      |

## COILS

|      |           |                                      |
|------|-----------|--------------------------------------|
| L553 | 17-05-021 | Coil, horizontal linearity 14" Color |
| L451 | 17-11-021 | Coil chock 4.7μH                     |

## CONNECTOR

|       |           |                                        |
|-------|-----------|----------------------------------------|
| CON1  | 10-11-041 | Header, shrouded 2.5,2PN               |
| CON2  | 10-11-041 | Header, shrouded 2.5, 29, N            |
| CON4  | 10-11-028 | Header, shrouded 2.5,3P, Y             |
| CON5  | 10-11-041 | Header, shrouded 2.5, Y,               |
| CON6  | 10-11-028 | Header, shrouded 2.5,3P,               |
| CON7  | 10-11-029 | Header, bead pin 2.36φ                 |
| CON8  | 10-11-037 | Header, shrouded 5/7.5, 3P, N          |
| CON9  | 10-11-037 | Header, shrouded 7.5,3P,N              |
| CON10 | 10-11-028 | Header, shrouded 2.5,3P,Y              |
| CON12 | 21-05-048 | Wire, shrouded hosing 3P, 50, N, 250mm |
| S-PIN | 10-11-040 | Header, bead pin JST                   |

## TRANSFORMERS

|      |           |                             |
|------|-----------|-----------------------------|
| T501 | 17-02-027 | Trans, flyback FCO-1445AL   |
| T401 | 17-02-002 | Trans, pincushion 0905004-A |
| T551 | 17-07-011 | Trans, Drive 0505005-A      |

## CORES

|      |           |                        |
|------|-----------|------------------------|
| L301 | 17-22-006 | Core, beads 2865002402 |
| L302 | 17-22-006 | Core, beads 2865002402 |
| L303 | 17-22-006 | Core, beads 2865002402 |
| L304 | 17-22-006 | Core, beads 2865002402 |
| L305 | 17-22-006 | Core, beads 2865002402 |
| L306 | 17-22-006 | Core, beads 2865002402 |

## JUMP WIRE

|       |           |                                               |
|-------|-----------|-----------------------------------------------|
| JPR-B | 21-02-050 | Stranded wire, AWM1007/#22(Red) R, 110mm      |
| JPR-A | 21-02-047 | Stranded wire, AWM1007/#22(Yellow) , Y, 135mm |
| JRR-C | 21-02-038 | Stranded wire, AWM1007/#22(Red) 240mm(2pcs)   |
| JL-77 | 21-02-005 | WIRE, BUS, SPA 0.6 52mm                       |

## HEAT SINK ASS'Y FOR IC 401

|       |           |                             |
|-------|-----------|-----------------------------|
| IC401 | 20-06-009 | IC, Linear, LA7830          |
|       | 06-25-025 | Heat Sink AL, Black V-Drive |
|       | 21-26-018 | T-Scr Rnd Head W/Washer     |
|       | 24-02-002 | M-Scr Pan Head W/Washer     |

# HEAT SINK ASS'Y FOR Q 552

|      |           |                                     |
|------|-----------|-------------------------------------|
| Q552 | 18-01-007 | TR NPN 2SD 900B                     |
|      | 06-25-033 | Heat Sink AL.W. Power Drive         |
|      | 23-03-002 | Mica To-3Type                       |
|      | 23-03-005 | Bushing 900B Type                   |
|      | 21-01-015 | Wire. Stranded AWM 1015/#22.BW.55   |
|      | 21-01-004 | Wire. Stranded AWM 1007/#2. or 55   |
|      | 21-06-029 | Wire. Ringter, Insulation 5φ RED 6φ |
|      | 12-21-002 | Tube. Shrinkable 4φ 20mm            |
|      | 24-02-002 | M-Scr Pan Head W/Washer M3×8W       |
|      | 24-02-007 | M-Scr Pan Head W/Washer M3×12W      |
|      | 24-31-001 | Nut Hex M3×0.5PW                    |
|      | 24-41-001 | Uasher. Flat 3.2×7×0.5W             |

## CONTRAST VOLUME ASS'Y(00-05-012)

|       |           |                                                               |
|-------|-----------|---------------------------------------------------------------|
| VR302 | 15-04-007 | Variable resistor, V-trimmer 500ohm, B, 0.1W                  |
|       | 21-05-039 | Wire, connector, housing (Black, blue): 2pcs, 2p. 2.5 290mm.N |

## BRIGHTNESS VOLUME ASS'Y(00-056-013)

|       |           |                                                              |
|-------|-----------|--------------------------------------------------------------|
| VR402 | 15-04-007 | Variable resistor, V-trimmer 500ohm, B, 0.1W                 |
|       | 21-05-040 | Wire, connector, housing (Black, blue): 1pcs, 3p.2.5 130mm.N |

## LED ASS'Y(00-08-013)

|      |           |                                                          |
|------|-----------|----------------------------------------------------------|
| 1601 | 19-06-003 | LED(Green) SE-6221                                       |
| R601 | 14-04-331 | Resistor, carbon 330KΩ 1/4W                              |
|      | 21-05-038 | Wire, connector housing 2p,2.5 N.R.BL 270mm<br>14" Color |

## POWER. SIGNAL CABLE ASS'Y(00-14-007)

|       |           |                                             |
|-------|-----------|---------------------------------------------|
|       | 10-05-061 | Back Plate Hips 40AF                        |
|       | 10-05-017 | Strain Relief 5P-4                          |
|       | 10-05-058 | Strain Relief 6P-4                          |
|       | 00-17-009 | Ass'y Signal Cable 9p. GND                  |
|       | 21-07-001 | P/S Cord.Sut. None. Deusing. 7ft BL 3/18AWG |
|       | 10-12-014 | Conn. Housing. AMP. 171158-1 3P. GR         |
| SW601 | 23-02-013 | Switch Push Bottom                          |
|       | 21-05-037 | Wire. Conn. Hosing 2p. 2.36. GR.R. 270mm    |
|       | 24-45-008 | Spring Compression 11×17×0.6                |
|       | 12-21-002 | Tube. Shrinkable 4φ 10mm                    |

## SOCKET P.C BOARD ASS'Y(00-02-027)

|           |                                     |
|-----------|-------------------------------------|
| 22-04-046 | Socket P.C.B board blank FR-1, 1.6t |
|-----------|-------------------------------------|

## RESISTOR

|       |           |                                          |
|-------|-----------|------------------------------------------|
| R351  | 14-03-820 | Resistor, carbon 47Ω, 1/4W               |
| R352  | 14-03-820 | Resistor, carbon 47Ω, 1/4W               |
| R353  | 14-03-820 | Resistor, carbon 47Ω, 1/4W               |
| R354  | 14-10-472 | Resistor, metal oxide 4.7K Ω, 2W         |
| R355  | 14-10-472 | Resistor, metal oxide 4.7K Ω, 2W         |
| R356  | 14-10-472 | Resistor, metal oxide 4.7K Ω, 2W         |
| R357  | 14-28-001 | Resistor, compisition, 2.2K Ω, 1/2W      |
| R358  | 14-28-001 | Resistor, compisition, 2.2K Ω, 1/2W      |
| R359  | 14-28-001 | Resistor, compisition, 2.2K Ω, 1/2W      |
| R360  | 14-04-271 | Resistor, carbon 270Ω, 1/4W              |
| R361  | 14-04-271 | Resistor, carbon 270Ω, 1/4W              |
| R362  | 14-04-271 | Resistor, carbon 270Ω, 1/4W              |
| R363  | 14-04-102 | Resistor, carbon 1K Ω, 1/4W              |
| R364  | 14-04-101 | Resistor, carbon 100Ω, 1/4W              |
| R365  | 14-04-102 | Resistor, carbon 1K Ω, 1/4W              |
| R366  | 14-06-105 | Resistor, carbon 1M Ω, 1/4W              |
| R369  | 14-06-334 | Resistor, carbon 330K Ω, 1/2W            |
| R370  | 14-05-102 | Resistor, carbon 1K Ω, 1/4W              |
| VR351 | 15-01-015 | Variable, H-Trimmed(Red) 5K Ω, B, 1/2W   |
| VR352 | 15-01-019 | Variable, H-Trimmed(Green) 5K Ω, B, 1/2W |
| VR353 | 15-01-019 | Variable, H-Trimmed(Blue) 5K Ω, B, 1/2W  |
| VR354 | 15-10-017 | Variable, H-Trimmed(Red) 500Ω, 0.2W      |
| VR355 | 15-10-018 | Variable, H-Trimmed(Blue) 500Ω, 0.2W     |

## CAPACITOR

|      |           |                              |
|------|-----------|------------------------------|
| C351 | 16-10-007 | Creamic capacitor 150pF, 50V |
|------|-----------|------------------------------|

|      |           |                                         |
|------|-----------|-----------------------------------------|
| C352 | 16-10-007 | Creamic capacitor 150pF, 50V            |
| C353 | 16-10-007 | Creamic capacitor 150pF, 50V            |
| C354 | 16-10-48  | Creamic capacitor 180pF, 50V            |
| C355 | 16-10-48  | Creamic capacitor 180pF, 50V            |
| C356 | 16-10-046 | Creamic capacitor 0.01 $\mu$ F, 500V    |
| C357 | 16-10-074 | Electrolytic capacitor 22 $\mu$ F, 250V |
| C358 | 16-10-016 | Creamic capacitor 0.01 $\mu$ F, 500V    |
| C360 | 16-10-048 | Creamic capacitor 180pF, 50V            |

#### DIODE

|      |           |                      |
|------|-----------|----------------------|
| D352 | 19-05-017 | Zener diode GZB9.1EB |
|------|-----------|----------------------|

#### HEAT SINK ASS'Y FOR C1507(00-06-032)

|          |           |                                            |
|----------|-----------|--------------------------------------------|
| Q351-353 | 18-07-016 | NPN, Transistor C1507                      |
|          | 06-25-026 | Heat sink(Block)                           |
|          | 24-31-001 | Hexagon net(M3 $\times$ 0.59W)             |
|          | 24-02-002 | Machine screw head W/Washer(3 $\times$ 8W) |
| CON301   | 10-11-029 | Header. Bead pin. 2.36 $\phi$              |
|          | 10-11-041 | Header. shrouded 2.5.2p.N 5267-2A          |
|          | 21-06-050 | Wire. ring terminal AWM 1015               |
|          | 21-05-047 | Wire. ring terminal 3p. 5.0. 190mm         |
|          | 00-14-008 | Ass'y G Lead connector                     |
|          | 21-06-051 | Bridged wire ring terminal 85mm            |
|          | 10-08-023 | CPT socket+CAP                             |

#### SMPS ASS'Y(G2-01-00)

|           |                            |
|-----------|----------------------------|
| 22-04-045 | P.C.Board blank FR-1. 1.6t |
|-----------|----------------------------|

#### RESISTOR

|       |           |                                         |
|-------|-----------|-----------------------------------------|
| R601  | 14-04-334 | Resistor, carbon 330K $\Omega$ 1/4W     |
| R602  | 14-04-221 | Resistor, carbon 220 $\Omega$ 1/4W      |
| R603  | 14-04-122 | Resistor, carbon 1.2K $\Omega$ 1/4W     |
| R604  | 14-04-123 | Resistor, carbon 12K $\Omega$ 1/4W      |
| R605  | 14-04-103 | Resistor, carbon 10K $\Omega$ 1/4W      |
| R606  | 14-04-101 | Resistor, metal oxide 100 $\Omega$ 2W   |
| R607  | 14-04-104 | Resistor, carbon 270K $\Omega$ 1/4W     |
| R608  | 14-04-104 | Resistor, carbon 100K $\Omega$ 1/4W     |
| R609  | 14-25-013 | Resistor, metal film 0.25 $\Omega$ 1/4W |
| R610  | 14-10-272 | Resistor, metal oxide 2.7K $\Omega$ 2W  |
| R611  | 14-04-270 | Resistor, carbon 27 $\Omega$ 1/4W       |
| R612  | 14-26-063 | Resistor, wire wound 39 $\Omega$ 5W     |
| R613  | 14-06-473 | Resistor, carbon 47K $\Omega$ 1/2W      |
| R615  | 14-09-201 | Resistor, metal oxide 200 $\Omega$ 1W   |
| R616  | 14-09-201 | Resistor, metal oxide 200 $\Omega$ 1W   |
| VR601 | 15-01-016 | Variable, H-Trimmer 10K $\Omega$ 1/4W   |
| TH601 | 15-06-001 | Thermistor 2SS20                        |
| P601  | 15-08-001 | PTC, Posistor, SC-452C, 06BG080N140     |

#### CAPACITOR

|      |           |                                                 |
|------|-----------|-------------------------------------------------|
| C601 | 16-25-004 | Metalized polyester capacitor 0.33 $\mu$ F 250V |
| C602 | 16-15-028 | Polypropylene capacitor 0.0033 $\mu$ F 250V     |
| C603 | 16-15-028 | Polypropylene capacitor 0.0033 $\mu$ F 250V     |
| C604 | 16-25-004 | Metalized polyester capacitor 0.33 $\mu$ F 250V |
| C609 | 16-01-075 | Electrolytic capacitor 220 $\mu$ F 220WV        |
| C610 | 16-01-075 | Electrolytic capacitor 220 $\mu$ F 220WV        |
| C611 | 16-04-007 | Electrolytic capacitor 100 $\mu$ F 25V          |
| C612 | 16-01-001 | Electrolytic capacitor 1 $\mu$ F 50V            |
| C613 | 16-14-015 | Mlyar capacitor 0.0082 $\mu$ F 50V              |
| C614 | 16-11-008 | Ceramic capacitor 22pF 50V                      |
| C615 | 19-14-014 | Mlyar capacitor 0.0068 $\mu$ F 50V              |
| C617 | 16-04-007 | Electrolytic capacitor 100 $\mu$ F 25V          |
| C618 | 16-04-007 | Electrolytic capacitor 100 $\mu$ F 25V          |
| C619 | 16-25-014 | Metalized polyester 0.0022 $\mu$ F 1.6KV        |
| C520 | 16-10-049 | Ceramic capacitor 560pF 2KV                     |
| C621 | 16-01-043 | Electrolytic capacitor 100 $\mu$ F 160V         |
| C623 | 16-01-043 | Electrolytic capacitor 100 $\mu$ F 160V         |
| C624 | 16-04-007 | Electrolytic capacitor 100 $\mu$ F 25V          |
| C625 | 16-04-007 | Electrolytic capacitor 100 $\mu$ F 25V          |

#### COIL

|      |           |                              |
|------|-----------|------------------------------|
| L601 | 07-22-008 | Core bead 2743002112         |
| L602 | 17-09-014 | Chock coil 4.7UH             |
| L603 | 17-09-016 | Chock coil 50UH              |
| FUSE | 23-01-023 | 250V, 3A(MF61NM), CLIP TYPE. |

|      |           |                 |
|------|-----------|-----------------|
| L604 | 17-09-018 | Chock coil 47UH |
| L605 | 17-09-018 | Chock coil 47UH |

#### DIODE

|      |            |                        |
|------|------------|------------------------|
| D601 | 19-03-009  | Switching diode IN4937 |
| D602 | 19-01-007  | Rectifier diode IN4007 |
| D603 | 19-03-009  | Switching diode IN4937 |
| D604 | 19-03-009  | Switching diode IN4937 |
| D605 | 19-013-023 | Rectifier diode RGP30G |
| D606 | 19-01-001  | Rectifier diode IN4001 |
| D607 | 19-01-001  | Rectifier diode IN4001 |
| BRD1 | 19-02-008  | Bridge diode KBP08     |

#### TRANS

|       |           |                 |
|-------|-----------|-----------------|
| T601  | 17-01-028 | Switching trans |
| LF601 | 17-08-011 | Coil Linefilter |
| T601  | 17-01-028 | Trans Power     |

#### IC

|       |           |                   |
|-------|-----------|-------------------|
| IC601 | 20-06-010 | Linear IC TDA4601 |
|-------|-----------|-------------------|

#### TRANSISTOR

|      |        |                      |
|------|--------|----------------------|
| Q601 | 18-005 | NPN Transistor BU508 |
|------|--------|----------------------|

#### ASS'Y 024 HEAT SINK(00-06-031)

|      |           |                      |
|------|-----------|----------------------|
| Q601 | 18-04-005 | TR NPN BU508         |
|      | 24-01-005 | M-Scr Pan Head M3×12 |
|      | 24-31-004 | Nut Hex M3×2.59      |
|      | 24-41-001 | Washer Flat          |
|      | 24-26-018 | Fscr Rnd Head Washer |
|      | 06-24-024 | Hest Sink(18×40×50)  |

#### MISCELLANEOUS

|          |           |                                        |
|----------|-----------|----------------------------------------|
| J601-605 | 21-02-005 | Jump Wire                              |
|          | 10-11-029 | Pin 2.36φ                              |
| GND1     | 21-06-023 | Wire, Ring Terminal 5φ G/Y60           |
| CON601   | 21-05-042 | HDR, Rock, 5/7.5 3P, N, Molex 5289-03A |
|          | 10-11-037 | Header 5/7.5 3Pin                      |

#### THE OTHERS

|        |           |                          |
|--------|-----------|--------------------------|
| CPT    | 26-17-002 | 37JGG 68X CPT            |
|        | 10-05-060 | Front Bezel Hips         |
|        | 24-04-016 | P-Scr Pan Head           |
|        | 24-41-013 | Washer Flat              |
|        | 21-01-047 | Wire. Holder N1.Y        |
|        | 24-45-008 | Comperssing Spring.      |
|        | 10-05-062 | S/W Cap. Hips            |
|        | 24-01-002 | M-Scr Pan head M3×5, W   |
|        | 24-04-014 | P-Scr. Pan Head #8×15, W |
|        | 06-21-018 | Plate S/W Sbhgl.         |
|        | 24-04-004 | P-Scr Pan Head           |
|        | 10-07-007 | Fastener                 |
|        | 06-22-020 | Brightness Knob          |
|        | 10-05-063 | Knob for Contrast        |
|        | 24-04-004 | P-Scr Pan Head           |
|        | 06-20-023 | P-Scr Chassis wire       |
|        | 24-04-014 | P-Scr Pan Head           |
|        | 24-02-002 | M-Scr Pan Head M3×8W     |
|        | 06-24-010 | Shield Bottom Cover      |
|        | 06-20-022 | Chassis Bottom           |
|        | 24-02-004 | M-Scr Pan Head           |
|        | 21-06-044 | Wire, Braid Shield Cead  |
| D-Coil | 17-11-002 | Degsussing Coil          |
|        | 10-05-059 | Rear Hosing Hips 40AF    |
|        | 24-26-042 | M-Scr Pan Head M4×13.5   |
|        | 24-02-004 | M-Scr Pan Head Washer    |
|        | 24-26-041 | M-Scr C/S Head M3×12     |
|        | 10-05-064 | Stand Hips 40AF          |
|        | 10-05-065 | Neck Hips 40AF           |
|        | 10-05-049 | Stand/Part Acetal        |
|        | 10-15-048 | Neck/Part Acetal         |
|        | 24-45-009 | Compression Spring       |

|           |                       |
|-----------|-----------------------|
| 24-03-006 | M-Scr Hex Head        |
| 24-33-001 | Nut Butterfly M5×0.89 |
| 24-41-013 | Washer Flat.          |
| 24-04-002 | P-Scr Pan Head        |
| 10-05-066 | Support for Tilt      |
| 10-05-067 | Hook for Tilt         |
| 24-26-041 | M-Scr C/S Head I682-D |
| 10-09-002 | Rubber Foot           |
| 13-13-027 | S/Foam Set SC-I4SSL   |
| 13-13-028 | S/Foam Set SC-I4SSR   |
| 13-11-054 | Box                   |
| 13-15-113 | Cabel Product         |
| 13-16-024 | Manual                |
| 00-26-013 | Front Logo            |

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FAX : (02) 757-4822/751-6868

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Tokyo 100, Japan  
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TLX : 2228009 Sansei  
FAX : (03) 581-4835

### LONDON OFFICE

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TLX : 264606 Stars Lg  
FAX : (01) 430-0096